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Progress Toward Elimination of *Haemophilus influenzae* Type b Disease Among Infants and Children — United States, 1987–1995

Before effective vaccines were available, *Haemophilus influenzae* type b (Hib) was the most common cause of bacterial meningitis among children in the United States, and an estimated one of 200 children aged <5 years developed invasive Hib disease (*1–4*). From December 1987—when Hib conjugate vaccines were introduced—through 1994, the incidence of invasive Hib disease declined 95% among children aged <5 years (*4,5*). Eliminating invasive Hib disease among children aged <5 years by 1996 is a goal of the Childhood Immunization Initiative (CII) (*6*). This report summarizes data about trends in invasive *H. influenzae* (Hi) disease during 1987–1995 from three separate surveillance systems (CDC's National Notifiable Diseases Surveillance System [NNDSS]; the National Bacterial Meningitis and Bacteremia Reporting System [NBMBRS]; and an active, multistate, laboratory-based surveillance system). The findings underscore the need for age-appropriate vaccination of infants and for complete investigation and reporting of cases of invasive Hi disease (*2*).

National Surveillance

State health agencies report weekly provisional notifiable diseases data to NNDSS through the National Electronic Telecommunications System for Surveillance (NETSS) (*7,8*). Because the primary purpose of NNDSS is timely national surveillance, the information transmitted includes only basic demographic data about persons with invasive Hi disease. NETSS permits electronic transmission of critical supplemental information (e.g., the type of clinical illness, serotype causing disease, Hib vaccination status, and clinical outcome) for cases of Hi disease; these data were reported consistently by approximately 25 states. NBMBRS collects information about invasive bacterial diseases in the United States and includes detailed information about each case identical to the supplemental information transmitted through NETSS. Approximately 11 states participated consistently in reporting through NBMBRS.

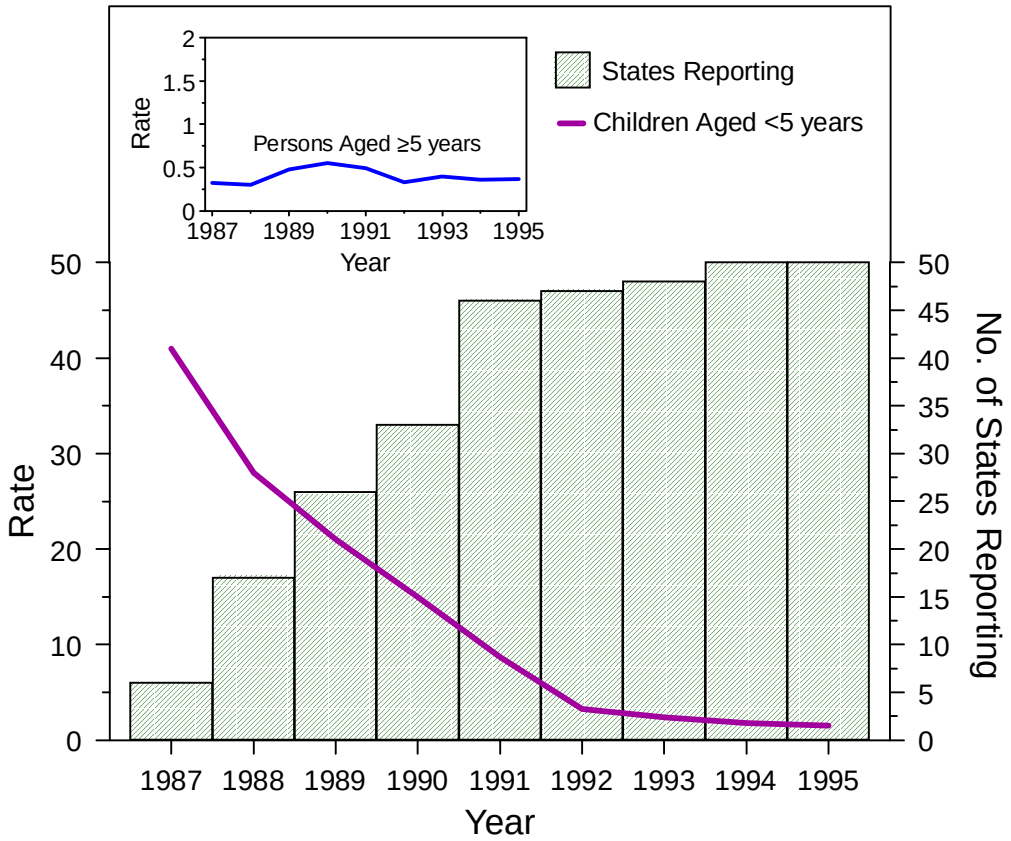
During June–July 1996, all states were contacted to obtain additional supplemental information about Hi disease among children aged <5 years who had onset of disease in 1995. Three states confirmed that no Hi cases had been reported in children aged <5 years while the remaining 47 states, the District of Columbia, and New York City submitted additional supplemental data.

Haemophilus influenzae — *Continued*

During 1987–1995, the incidence of invasive Hi disease among children aged <5 years declined 96% (from 41 cases per 100,000 children to 1.6) (Figure 1) (*5*). However, the incidence of Hi disease among persons aged ≥5 years remained stable during this period. Of the 317 cases of invasive Hi disease among children aged <5 years reported in 1995, serotype data were available for 201 (63%) cases. In 1995, Hib accounted for 86 (43%) isolates for which serotype was known; of these, 47 (55%) cases occurred among non-Hispanic whites, 13 (15%) among non-Hispanic blacks, five (6%) among American Indians/Alaskan Natives, two (2%) among Asians/Pacific Islanders, and 12 (14%) among Hispanics; race/ethnicity data were missing for seven (8%).

Of the 74 (86%) Hib case-patients identified in 1995 for whom information about age and vaccination status were available, 33 (45%) were unvaccinated and 41 (55%) had received at least one Hib-containing vaccine; all but three children had their first vaccination at age <7 months (Table 1). Twenty-two children were age-appropriately vaccinated before disease onset, including three children who began the series late. Among 18 children who had completed a primary series before onset of Hib disease, each had completed the two- or three-dose series with one of the three licensed vac-

FIGURE 1. Incidence rate* of invasive *Haemophilus influenzae* (Hi) disease among children aged <5 years, incidence rate† of invasive Hi disease among persons aged ≥5 years, and number of states reporting Hi surveillance data — United States, National Notifiable Diseases Surveillance System, 1987–1995§



*Per 100,000 children aged <5 years.
†Per 100,000 persons aged ≥5 years.
§Because of the low number of states reporting surveillance data during 1987–1990, rates for those years were race-adjusted using the 1990 U.S. population.

Haemophilus influenzae — *Continued*

TABLE 1. Number of children aged <5 years with invasive *Haemophilus influenzae* type b (Hib) disease, by age group and number of Hib vaccine doses received — United States, 1995*

Age group (mos.)	No. vaccine doses					Vaccination status unknown	Total
	0	1	2	3	4		
0– 1	7	–	–	–	–	2	**9**
2– 3	9	5	–	–	–	3	**17**
4– 5	6	9	2	–	–	2	**19**
6–11	8	3	3	4	–	3	**21**
12–60	3	2	1	7	5	2	**20**
Total	**33**	**19**	**6**	**11**	**5**	**12**	**86**

*Reported through the National Notifiable Diseases Surveillance System, the National Bacterial Meningitis and Bacteremia Reporting System, and states reporting additional supplementary information.

cines (i.e., vaccines had not been used interchangeably). Vaccine manufacturer lot numbers were available for 12 of the 18 children; among these children, no single lot was used to complete the series.

Laboratory-Based Surveillance

The active laboratory-based system coordinated by CDC includes surveillance projects which, during 1989–1994, maintained continuous surveillance of 10.5 million persons in four areas (three counties in the San Francisco Bay area, eight counties in metropolitan Atlanta, four counties in Tennessee, and the state of Oklahoma) (*5*). During 1995, the population under surveillance was 12.8 million persons in four areas (three counties in the San Francisco Bay area, eight counties in metropolitan Atlanta, five counties in Tennessee, and the state of Maryland). Information routinely obtained about all cases of invasive Hi disease included serotype, clinical syndrome and outcome, vaccination status, and demographic information. Because blacks were overrepresented in the surveillance population, rates were race-adjusted to the 1990 U.S. population.

During 1989–1995, the race-adjusted incidence of invasive Hib disease among children aged <5 years decreased substantially compared with the decrease in incidence of non-type b Hi disease among children (Figure 2). Among children aged <5 years, during 1989–1995 the incidence of invasive Hib cases declined 99% (from 34 cases per 100,000 in 1989 to 0.4 cases in 1995). During 1995, Hib accounted for 18% of all the Hi isolates serotyped from children aged <5 years. Information about vaccination status was available for one of the four children aged <5 years with invasive Hib disease. This infant had received one dose of vaccine, although he was aged 4.5 months at disease onset and was eligible to have received two doses. One child was too young to be vaccinated, and the other two children for whom vaccination information was not available were aged 6 and 9 months.

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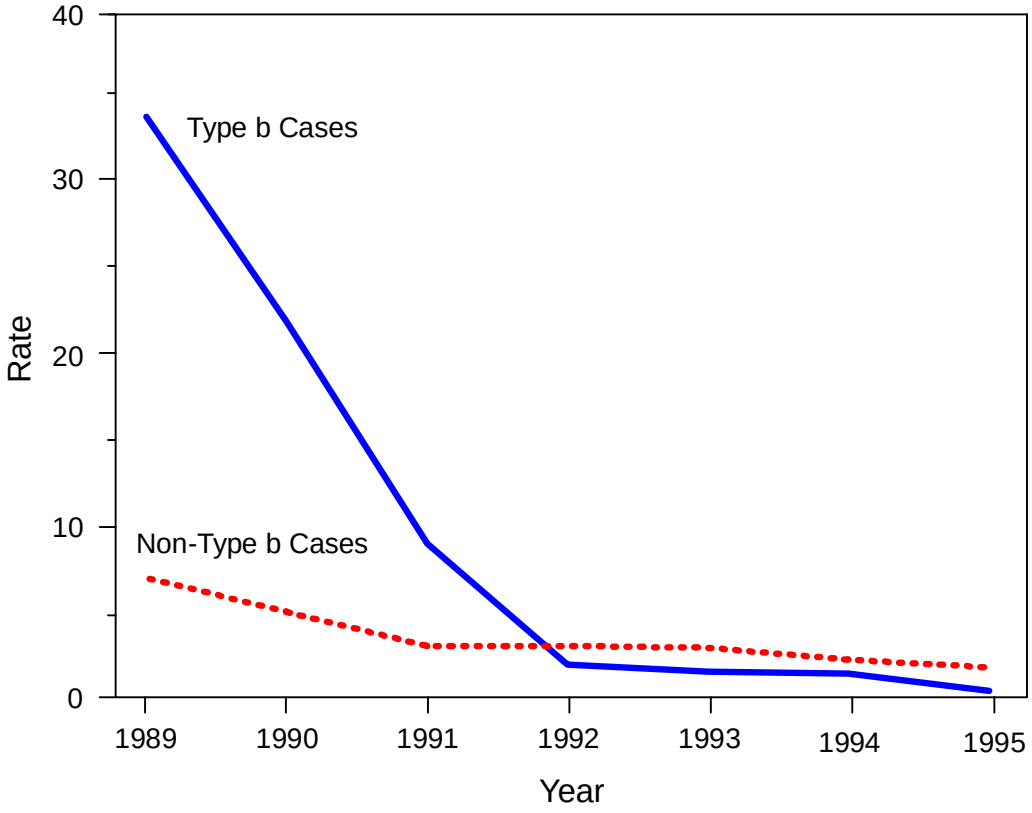
Haemophilus influenzae — *Continued*

FIGURE 2. Race-adjusted incidence rate* for invasive *Haemophilus influenzae* type b and non-type b disease detected through active laboratory-based surveillance† among children aged <5 years — United States, 1989–1995



*Per 100,000 children aged <5 years.
†During 1989–1994, the surveillance area population was 10.5 million in four areas (three counties in the San Francisco Bay area, eight counties in metropolitan Atlanta, four counties in Tennessee, and the state of Oklahoma). In 1995, the surveillance area population was 12.8 million persons in four areas (three counties in the San Francisco Bay area, eight counties in metropolitan Atlanta, five counties in Tennessee, and the state of Maryland).

Editorial Note: The findings in this report document the continued decline in the incidence of invasive Hib disease among children aged <5 years in the United States—a trend associated with the increased use of Hib conjugate vaccines. These findings also affirm two of the primary barriers to eliminating invasive Hib disease among children: disease among undervaccinated children and among children too young to complete the primary series of Hib vaccination.

Identification of the serotype of cases of invasive Hi disease is essential for evaluating changes in the epidemiology of Hib disease. In the United States, the percentage of invasive Hi disease cases among children with serotype information has increased substantially, from 41% of 340 cases in 1994 to 63% of 317 cases in 1995 (*5*). These data suggest that the proportion of Hi cases caused by Hib has been decreasing.

Invasive Hib disease now occurs primarily among undervaccinated children and among infants too young to have completed the primary series of vaccinations. However, among children aged 19–35 months, Hib vaccination coverage with three or

more doses of Hib vaccine increased substantially from the second quarter of 1994 (76%) to the second quarter of 1995 (92%) (*9*). Although widespread vaccination with conjugate vaccine has reduced Hib colonization rates among young children, circulation of the organism continues (*1,4*). Population groups with low levels of vaccination probably contribute to the ongoing occurrence of disease and regional differences in disease incidence. Consequently, all health-care providers who counsel parents about childhood vaccination should emphasize the importance of protecting infants against Hib disease and ensure that the vaccine is administered in a timely manner, especially to children of low socioeconomic status who may be more likely to be undervaccinated or unvaccinated (*2,10*). The small proportion of Hib cases reported through national surveillance among children who had completed a primary Hib vaccine series with vaccines from different manufacturers and with different lot numbers suggests that vaccine failure occurs infrequently.

The findings in this report indicate that the incidence of invasive Hib disease among preschool-aged children has continued to decline, consistent with the goal to eliminate invasive Hib disease among children aged <5 years. However, to attain this goal, timely and complete vaccination coverage is needed among all preschool-aged children (*2*). Because conjugate vaccines reduce Hib carriage and interrupt transmission of the organism, complete coverage among preschool-aged children will help to eliminate disease among infants who are too young to be completely vaccinated (*1,2,4*).

To monitor progress toward meeting the goal of elimination of invasive Hib disease among children aged <5 years and to evaluate changes in the epidemiology of invasive Hi disease, national surveillance for Hi should be strengthened. To optimize surveillance efforts, case reporting should include four elements. First, because Hib vaccines protect against Hi serotype b organisms only, serotyping should be performed for all cases of invasive Hi disease—state health departments are encouraged to identify laboratories in which serotyping is conducted for all Hi isolates or to send Hi isolates to CDC for serotyping. In addition, assessments of children in older age groups (5–14 years) will be needed to document persistence of protection by Hib conjugate vaccines. Second, to improve characterization of groups at risk for undervaccination and Hib disease, vaccination status of all children with invasive Hib disease should be assessed. Third, to ensure continued high levels of vaccine effectiveness and to enable systematic evaluation of factors associated with vaccine failure in persons with Hib disease, the date, vaccine manufacturer, and vaccine lot number should be included in the case report. Fourth, important indicators of the severity of Hi infections should be reported, including the type of clinical syndrome, specimen source (e.g., cerebrospinal fluid, blood, or joint fluid), and clinical outcome.

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Haemophilus influenzae — *Continued*

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Factors Associated with Self-Perceived Excellent and Very Good Health Among Blacks — Kansas, 1995

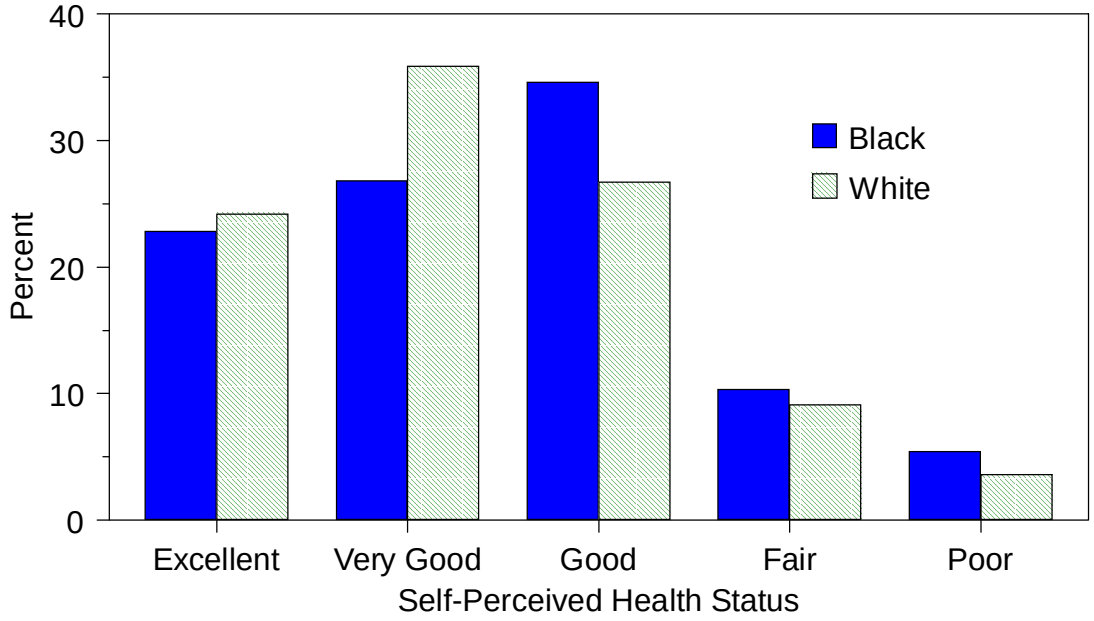
Self-perceived health is related to functional status, morbidity, and mortality and is an important measure in determining health status and health-related quality of life (HRQOL) scales (*1*). In 1994, the group of health professionals who established the health status indicators for *Healthy People 2000* (*2*) recommended that states examine the indicators for major demographic subgroups (e.g., racial/ethnic groups). The Kansas Department of Health and Environment (KDHE) analyzed data from the 1995 Behavioral Risk Factor Surveillance System (BRFSS) supplemental survey of blacks in Kansas to determine the relation between self-perceived excellent and very good health (EVGH) and physical functioning, mental functioning, role limitations, access to care, and health behaviors among blacks—the largest racial/ethnic minority group in that state. This report summarizes the findings of the analysis, which indicate that several factors related to demographics, physical functioning, and health behaviors were associated with EVGH.

BRFSS is a population-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. adult population aged ≥18 years. In 1995, BRFSS was conducted in 50 states and provides population-based estimates of the prevalence of health behaviors, health-care access, and selected chronic conditions. Since 1993, BRFSS has included the option of a health status module (*3–5*). In Kansas, a supplemental survey to the statewide BRFSS was conducted in 1995 using all telephone prefixes having an estimated ≥10% of households self-identified as black race based on 1990 census data. Self-identified blacks aged ≥18 years (n=518; response rate=83%) participated in a structured interview that included the question, "Would you say in general your health is . . . excellent, very good, good, fair, or poor?" In addition, respondents were asked several questions about their health status, access to care, health behaviors, and demographics. All analyses were unweighted. Odds ratios (ORs) and 95% confidence intervals (CIs) were used to measure the association between categorical variables and EVGH. A chi-square test for trend was conducted to determine whether income was associated with EVGH. Factors bivariately associated with EVGH were analyzed by sex-specific logistic regression models.

Overall, the crude percentage of EVGH reported by blacks surveyed was 49% (54% of men and 47% of women); in comparison, 60% of whites surveyed in the 1995 statewide BRFSS reported EVGH (Figure 1). Annual household income <$25,000 (OR=0.3, 95% CI=0.2–0.4) and reporting hypertension were negatively associated with EVGH

Excellent and Very Good Health — Continued

FIGURE 1. Percentage of respondents reporting self-perceived health status, by race* — Kansas, 1995



*Data for whites were obtained from the 1995 statewide Behavioral Risk Factor Surveillance System (BRFSS) survey. Data for blacks were obtained from the 1995 supplemental survey for BRFSS.

among both black men and black women (OR=0.3, 95% CI=0.2–0.4). The sex-specific percentage of EVGH varied by other demographic and descriptive characteristics (Table 1). Among women, factors positively associated with EVGH by bivariate analysis were working for wages (OR=2.0, 95% CI=1.2–3.3), being aged <45 years (OR=1.9, 95% CI=1.1–3.2), and reporting no days of poor physical health during the previous 30 days (OR=3.6, 95% CI=2.0–6.4). Of the 10 factors negatively associated with EVGH among women by bivariate analysis, the association was strongest for having diabetes (OR=0.08, 95% CI=0.01–0.3), having any limitations (OR=0.2, 95% CI=0.05–0.4), and being unable to work (OR=0.2, 95% CI=0.02–0.7) (Table 1). Among men, factors positively associated with EVGH by bivariate analysis included working for wages (OR=2.2, 95% CI=1.2–4.2) and age <45 years (OR=2.7, 95% CI=1.5–5.2). Of the eight factors negatively associated with EVGH among men by bivariate analysis, the association was strongest for being unable to work (OR=0.1, 95% CI=0.0–0.8), having any limitations (OR=0.2, 95% CI=0.05–0.4), and needing daily medications (OR=0.2, 95% CI=0.1–0.5) (Table 1).

Because of interaction between sex, insurance status, and income with EVGH, sex-specific logistic regression models were constructed to adjust for factors independently associated with EVGH. Multivariate analysis indicated that, among women, factors negatively associated with EVGH included diabetes (OR=0.2, 95% CI=0.04–0.9), any limitations (OR=0.3, 95% CI=0.01–0.6), annual household income <$25,000 (OR=0.3, 95% CI=0.2–0.5), hypertension (OR=0.4, 95% CI=0.2–0.8), and having smoked at least 100 cigarettes (OR=0.3, 95% CI=0.2–0.5). Among men, those with health insurance and an annual household income ≥$25,000 were 17 times more likely to report EVGH than those with no health insurance and an annual household income <$25,000.

Excellent and Very Good Health — Continued

TABLE 1. Unweighted percentage of black survey respondents who reported excellent or very good health (EVGH), by sex and selected characteristics — supplemental Behavioral Risk Factor Surveillance System survey, Kansas, 1995*

Characteristic	Men (n=207) Sample size	(%)	(95% CI†)	Women (n=311) Sample size	(%)	(95% CI)
Age group (yrs)§						
18–24	37	(64.9)	(47.5%–79.8%)	59	(55.9)	(42.4%–68.8%)
25–44	92	(62.0)	(51.2%–71.9%)	154	(50.0)	(41.8%–58.2%)
45–64	60	(43.3)	(30.6%–56.8%)	63	(41.3)	(29.0%–54.4%)
65–74	11	(18.2)	(2.3%–51.8%)	23	(21.7)	(7.5%–43.7%)
≥75	5	(20.0)	(0.5%–71.6%)	10	(40.0)	(12.2%–73.8%)
Education level§						
Less than high school	27	(25.9)	(11.1%–46.3%)	30	(36.7)	(19.9%–56.1%)
High school graduate	68	(50.0)	(37.6%–62.4%)	123	(37.4)	(28.8%–46.6%)
Some college	70	(62.9)	(50.5%–74.1%)	103	(54.4)	(44.3%–64.2%)
College graduate	40	(62.5)	(45.8%–77.3%)	53	(60.4)	(46.0%–73.5%)
Annual household income¶						
<$14,999	15	(33.3)	(11.8%–61.6%)	35	(22.9)	(10.4%–40.1%)
$15,000–$24,999	63	(34.9)	(23.3%–48.0%)	119	(37.0)	(28.3%–46.3%)
$25,000–$49,999	83	(68.7)	(57.6%–78.4%)	93	(66.7)	(56.1%–76.1%)
≥$50,000	28	(67.9)	(47.6%–84.1%)	34	(52.9)	(35.1%–70.2%)
Employment status§						
Employed	154	(60.4)	(52.2%–68.2%)	199	(54.3)	(47.1%–61.3%)
Unemployed	12	(41.7)	(15.2%–72.3%)	22	(36.4)	(17.2%–59.3%)
Homemaker	0	—	—	16	(43.8)	(19.8%–70.1%)
Student	7	(71.4)	(29.0%–96.3%)	20	(50.0)	(27.2%–72.8%)
Retired	23	(26.1)	(10.2%–48.4%)	36	(27.8)	(14.2%–45.2%)
Unable to work	9	(11.1)	(0.3%–48.2%)	16	(12.5)	(1.6%–38.3%)
Marital status§						
Married	78	(52.6)	(40.9%–64.0%)	99	(53.5)	(43.2%–63.6%)
Divorced	38	(57.9)	(40.8%–73.7%)	70	(43.6)	(32.4%–56.7%)
Widowed	9	(44.4)	(13.7%–78.8%)	31	(29.0)	(14.2%–48.0%)
Separated	10	(30.0)	(6.7%–65.2%)	18	(38.9)	(17.3%–64.3%)
Never married	60	(58.3)	(44.9%–70.9%)	85	(45.9)	(35.0%–57.0%)
Unmarried couple	10	(50.0)	(18.7%–81.3%)	6	(50.0)	(11.8%–88.2%)
Have health insurance§						
Yes	175	(53.7)	(46.0%–61.3%)	260	(45.8)	(39.6%–52.0%)
No	30	(53.3)	(34.3%–71.7%)	49	(53.1)	(38.3%–67.5%)
Needed to see a doctor but didn't because of cost						
Yes	25	(48.0)	(27.8%–68.7%)	49	(28.6)	(16.6%–43.3%)
No	180	(54.4)	(46.9%–61.9%)	260	(50.4)	(44.1%–56.6%)

* n=518.
† Confidence interval.
§ Excludes two men and two women for whom this characteristic was missing.
¶ Excludes 18 men and 30 women for whom either EVGH or income data were missing.
** Excludes three men and one woman for whom either EVGH or smoking data were missing.

Excellent and Very Good Health — Continued

TABLE 1. Unweighted percentage of black survey respondents who reported excellent or very good health (EVGH), by sex and selected characteristics — supplemental Behavioral Risk Factor Surveillance System survey, Kansas, 1995*

	Men (n=207)			Women (n=311)		
Characteristic	**Sample size**	**(%)**	**(95% CI†)**	**Sample size**	**(%)**	**(95% CI)**
Have diabetes§						
Yes	7	(14.3)	(0.4%–57.9%)	24	(4.2)	(0.1%–21.1%)
No	198	(55.1)	(47.8%–62.1%)	285	(50.5)	(44.6%–56.5%)
Have hypertension§						
Yes	63	(31.7)	(20.6%–44.7%)	112	(28.6)	(20.4%–37.9%)
No	142	(63.4)	(54.9%–71.3%)	197	(57.4)	(50.1%–64.4%)
Have high blood cholesterol level§						
Yes	35	(42.9)	(26.3%–60.6%)	51	(31.4)	(19.1%–45.9%)
No	170	(55.9)	(48.1%–63.5%)	258	(50.0)	(43.7%–56.3%)
Take daily medications						
Yes	47	(27.7)	(15.6%–42.6%)	84	(25.0)	(16.2%–35.6%)
No	158	(61.4)	(53.3%–69.0%)	225	(55.1)	(48.4%–61.7%)
Have any activity limitation§						
Yes	47	(31.9)	(19.1%–47.1%)	78	(25.6)	(16.4%–36.8%)
Duration ≤1 yr	*22*	*(45.4)*	*(22.4%–67.8%)*	*34*	*(38.2)*	*(22.2%–56.4%)*
2–4 yrs	*10*	*(40.0)*	*(12.2%–73.8%)*	*20*	*(15.0)*	*(3.2%–37.9%)*
≥5 yrs	*15*	*(6.7)*	*(0.2%–31.9%)*	*24*	*(16.7)*	*(4.7%–37.4%)*
No	158	(60.1)	(52.0%–67.8%)	231	(54.1)	(47.5%–60.7%)
Have smoked ≥100 cigarettes during lifetime**						
Yes	111	(50.5)	(40.8%–60.1%)	188	(36.1)	(29.3%–43.5%)
No	93	(58.1)	(47.4%–68.2%)	122	(54.3)	(44.8%–63.2%)

*n=518.
†Confidence interval.
§Excludes two men and two women for whom this characteristic was missing.
¶Excludes 18 men and 30 women for whom either EVGH or income data were missing.
**Excludes three men and one woman for whom either EVGH or smoking data were missing.

Multivariate analysis indicated that factors negatively associated with EVGH among men included the duration of activity limitations in years (OR=0.8, 95% CI=0.7–1.0) and hypertension (OR=0.4, 95% CI=0.2–0.9).

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Editorial Note: Many of the national health objectives for the year 2000 are directed toward improving the health of U.S. minority populations. BRFSS is an effective means for states to measure and compare health outcomes and HRQOL among different groups. Kansas is the first state to report findings from a study using this approach to characterize factors associated with positive self-perceived health levels among

Excellent and Very Good Health — Continued

racial/ethnic minority groups. In addition to this assessment of blacks, KDHE has implemented a similar supplemental BRFSS survey of Hispanics (the second largest and most rapidly increasing racial/ethnic minority group in the state).

The finding that self-perceived EVGH was lower among blacks than among whites is consistent with mortality patterns in Kansas, which, when compared with those of whites, indicate the average age at death for black men and black women is 12.5 years younger and 13.4 years younger, respectively. The positive association between EVGH and an annual household income ≥$25,000 for both black men and black women underscores previous studies indicating the impact of economics on self-perceived health status (*6*). In addition, the findings suggest that efforts to improve the health status of blacks and, therefore, self-perceived health and HRQOL, should be directed toward preventing activity limitations and hypertension among men and toward preventing diabetes, smoking initiation, and activity limitations among women.

The findings in this report are subject to at least five limitations. First, temporal variations in the relation between variables associated with EVGH have not been characterized, and the potential for increasing self-perceived EVGH by altering these factors is unknown. Second, many of the biologically and psychologically plausible determinants of EVGH (e.g., chronic conditions such as heart disease, cancer, and arthritis) were not associated with EVGH, probably reflecting the small sample size or misclassification. Third, the findings of the study may not be generalizable to all blacks in the state because black households without telephones and those in areas of the state with <10% of the households self-identified as black were not eligible for survey selection. Fourth, identification of self-perceived health status may vary by cultural groups, and comparisons of that status across groups may reflect cultural differences rather than health status. Finally, the factors studied were chosen based on hypotheses, some limited literature, and available data and were not identified by the respondents as factors important to them and their health status.

The relation between the duration of activity limitations and EVGH among black men in Kansas suggests the need to better characterize the types and causes of activity limitations among this group to enable development of appropriate interventions. The findings also suggest that, for some women, strategies for improving self-perceived health might include programs for diabetes self-management, education of health-care providers, prevention of smoking initiation, and promotion of general health. KDHE, in collaboration with an advisory group to the BRFSS supplemental survey of blacks, is implementing interventions to improve HRQOL among black residents of Kansas. Examples of such efforts include extended diabetes outreach and education to black women and the involvement of churches to reach both men and women with hypertension. KDHE is planning future BRFSS surveys to assess the impact of these programs.

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Update: Mass Vaccination with Oral Poliovirus Vaccine — Asia and Europe, 1996

In 1995, a group of 18 geographically contiguous countries in Europe, Central and South Asia, and the Middle East cooperated in conducting coordinated National Immunization Days (NIDs)* with oral poliovirus vaccine (OPV) (*1*). The World Health Organization (WHO) had designated this effort "Operation MECACAR" (MEditerranean, CAucasus, and Central Asian Republics)†. Operation MECACAR was repeated in 1996 with the addition of the Russian Federation (Figure 1). This report describes OPV coverage achieved during the mass vaccination campaign in 1996 and summarizes the impact of the NIDs on poliomyelitis incidence during 1995 and the first 6 months of 1996.

To maximize the geographic area covered and the number of children targeted simultaneously for mass vaccination campaigns with OPV, adjoining countries in Europe (Armenia, Azerbaijan, Bulgaria [1995 only], Georgia, Russia [starting in 1996], and Turkey), Central Asia (Kazakstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), South Asia (Afghanistan, Iran, and Pakistan), and the Middle East (Iraq, Jordan, Lebanon, Syria, and West Bank and Gaza) conducted synchronized NIDs during 1995 and 1996 and are planning to conduct NIDs in 1997. Based on the desirability of scheduling mass vaccination campaigns during the low polio incidence season, all rounds of NIDs were scheduled during March–May. The only exception was Pakistan, which conducted NIDs in December 1995 and January 1996 to synchronize efforts with India (*2*) and China (*3*).

A total of 62 million children were targeted to receive two doses each of OPV, including 16 million children aged <4 years in Europe and Central Asia (the European Region of WHO [EURO]) and 46 million children aged <5 years in South Asia and the Middle East (the Eastern Mediterranean Region of WHO [EMRO]). Reported coverage was 92%–99% for each round in EURO and 84%–100% in EMRO (Table 1).

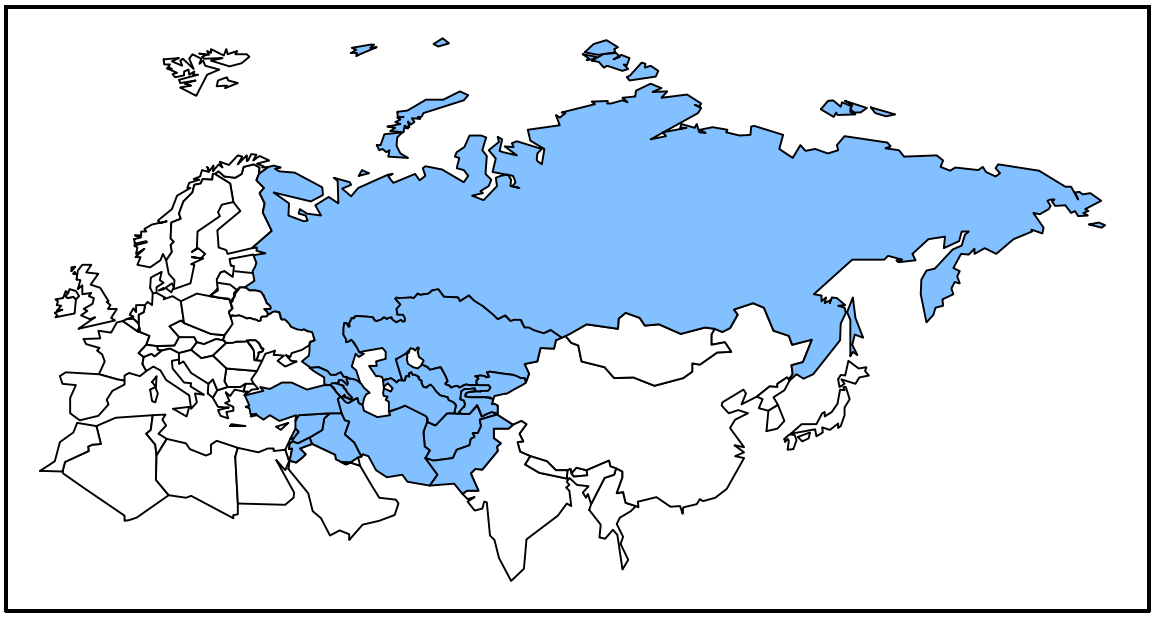
The mass vaccination efforts were followed by declines among participating countries in the incidence of polio reported to EURO and EMRO. In EURO, 50 cases of polio were reported in 1995, compared with 201 cases in 1994. For the first 6 months of 1996, a total of 13 cases of polio were reported from participating countries in EURO (all from Russia and Turkey). In EMRO, 647 cases of polio were reported from participating countries in 1995, compared with 691 cases in 1994. For the first 6 months of

*Mass campaigns over a short period (days to weeks) in which two doses of oral poliovirus vaccine are administered to all children aged <5 years, regardless of prior vaccination history, with an interval of 4–6 weeks between doses.

†Operation MECACAR is supported by a coalition of organizations that include WHO, United Nations Children's Fund (UNICEF), other bilateral and multilateral organizations, and Rotary International.

Oral Polio Vaccine — Continued

FIGURE 1. Countries participating in Operation MECACAR — 1996



1996, a total of 60 cases of polio were reported from these countries in South Asia and the Middle East (Table 1).

Reported by: Regional Office for Europe, Copenhagen; Regional Office for Eastern Mediterranean Region, Alexandria; Global Programme for Vaccines and Immunization, World Health Organization, Geneva, Switzerland. Respiratory and Enterovirus Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Polio Eradication Activity, National Immunization Program, CDC.

Editorial Note: In 1988, the World Health Assembly, the governing body of WHO, resolved to eradicate polio from the world by the year 2000 (*4*); efforts to achieve this goal have progressed rapidly in many regions. For example, in 1994, the Western Hemisphere was certified as free of wild poliovirus (*5*), and substantial progress has been achieved in the rest of the world (*6*). These successful efforts have been associated with the implementation of recommended strategies for polio eradication, which include 1) achieving and maintaining high routine vaccination coverage with OPV; 2) instituting sensitive surveillance systems for polio; 3) introducing NIDs; and 4) conducting other supplemental vaccination activities (e.g., mopping-up operations). In 1995, approximately 300 million children aged <5 years (an estimated one half of the world's children in this age group) received OPV administered during NIDs (*6*). By the end of 1996, all polio-endemic countries of Europe and Asia will have conducted NIDs, and 29 countries in the African Region of WHO will implement NIDs (n=26) or Sub-National Immunization Days (SNIDs) (n=three) (*6*).

The collaboration among the 18 countries in EURO and EMRO for polio eradication has included countries characterized by different political systems and economies and racial/ethnic and religious diversity. In 1996, as a result of a large polio outbreak in Chechnya in 1995 (*7*) and suboptimal routine vaccination coverage in some states, Russia joined the coalition of countries comprising Operation MECACAR. Bulgaria conducted successful NIDs in 1995 and increased coverage especially among Gypsy populations, but did not participate in Operation MECACAR in 1996. In Albania, NIDs

Oral Polio Vaccine — Continued

TABLE 1. Percentage of oral poliovirus vaccine (OPV) coverage achieved during National Immunization Days* in 1996, and reported poliomyelitis cases during 1994–June 1996, by World Health Organization (WHO) region and countries participating in Operation MECACAR

WHO region/ Country	1996 % Coverage		No. reported polio cases		
	Round 1	Round 2	1994	1995	1996†
EURO§					
Armenia	99%	98%	5	3	0
Azerbaijan	97%	98%	16	5	0
Georgia	92%	95%	0	0	0
Kazakhstan	97%	99%	4	1	0
Kyrgyzstan	98%	99%	0	0	0
Russian Federation	99%	99%	5¶	154¶	3
Tajikistan	95%	99%	26	0	0
Turkey	93%	96%	27	32	10
Turkmenistan	99%	99%	6	8	0
Uzbekistan	98%	98%	117	1	0
Total			**201**	**50**	**13**
EMRO**					
Afghanistan	87%	84%	NR††	NR	NR
Iran	99%	100%	93	101	15§§
Iraq	98%	98%	63	34	3
Jordan¶¶	>100%	>100%	4	0	0
Lebanon	99%	95%	2	0	0
Pakistan¶¶	>100%	>100%>	527	508	42
Syria¶¶	>100%	>100%>	2	4	0
West Bank and Gaza¶¶	>100%	>100%>	NR	0	0
Total			**691**	**647**	**60**

*Mass campaigns over a short period (days to weeks) in which two doses of OPV are administered to all children aged <5 years, regardless of prior vaccination history, with an interval of 4–6 weeks between doses.
†January–June.
§Comprising countries in Europe and Central Asia.
¶Russia joined Operation MECACAR in 1996; cases reported in 1994 and 1995 are excluded from the regional total.
**Comprising countries in South Asia and the Middle East.
††Not reported.
§§January–May.
¶¶Coverage levels above 100% result from vaccinating children outside the target age group (numerator problem) and uncertainties about the exact target age group (denominator problem).

were conducted during April and May 1996. In the fall of 1996, NIDs will be conducted in Moldova and Ukraine, while Romania and Serbia and Montenegro will conduct SNIDs.

The primary purpose of mass vaccination campaigns with OPV is to interrupt the transmission of wild poliovirus. These mass vaccination efforts have interrupted wild poliovirus transmission in many areas of Europe, as reflected by the rapid decrease in cases in EURO following the efforts conducted in 1995 and 1996; of the 50 countries in EURO, only four (Albania [*8*], Russia, Turkey, and Ukraine) have reported polio cases

Oral Polio Vaccine — Continued

in 1996. Despite some dramatic successes in EMRO (Iran, Jordan, Lebanon, and West Bank and Gaza), other countries (Afghanistan, Iraq, Pakistan, and Syria) reported more limited progress in 1995. For example, Pakistan continued to report more than half (64%) of the regional total number of polio cases in EMRO, and Syria detected four polio cases associated with isolation of wild poliovirus. However, preliminary data for January–June 1996 suggest a substantial decline in the number of reported cases in both EURO and EMRO countries (Table 1).

The technical basis for achieving worldwide polio eradication already exists; however, insufficient political will, inadequate funding, and other barriers will need to be addressed to ensure that polio will be eradicated by the year 2000.

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Preliminary Data on Births and Deaths — United States, 1995

Timely and accurate health data are essential to public health surveillance efforts for monitoring trends in vital events, diseases, injuries, and disabilities. More timely release of accurate vital statistics has been identified as a priority by health agencies at the federal, state, and local levels and in academia and the private sector. In response to the need for faster release of high-quality data, CDC's National Center for Health Statistics (NCHS), in collaboration with state vital statistics offices, has initiated a new system to speed the transmission of vital statistics from states to CDC. This initiative has resulted in the availability of near-final natality and mortality data approximately 1 year before final data usually are released. This report presents the selected findings of an analysis of preliminary birth and death records for 1995. The number of births in the United States declined for the fifth consecutive year to an estimated 3,900,089 in 1995, 1% fewer than the final 1994 total of 3,952,767 (Table 1) (*1*). In addition, the estimated number of deaths in 1995 totaled 2,312,180 (Table 2), 1% more than the previous record high of 2,278,994 in 1994 (*3*).

Detailed natality statistics, which previously have not been available before release of the final data, are based on 90% of the births registered in 1995. Mortality statistics are based on up to 90% of deaths occurring in 1995; the only mechanism previously used for releasing provisional detailed mortality statistics before the release of final data was the Current Mortality Sample, based on a 10% sample of deaths. The death

TABLE 1. Total number of births, percentage of births with selected demographic and health characteristics, and birth rates by maternal age, by race* and ethnicity of mother — United States, final 1994 data and preliminary 1995 data

	White		Black		Hispanic†		Total§	
Births	**1994**	**1995**	**1994**	**1995**	**1994**	**1995**	**1994**	**1995**
Number	3,121,004	3,105,315	636,391	598,558	665,026	671,849	3,952,767	3,900,089
	Percentage							
Births to mothers aged <20 years	11.3%	11.5%	23.2%	23.2%	17.8%	18.0%	13.1%	13.2%
Births to unmarried mothers	25.4%	25.3%	70.4%	69.5%	43.1%	40.8%	32.6%	32.0%
Low birthweight¶	6.1%	6.2%	13.2%	13.0%	6.2%	6.3%	7.3%	7.3%
Births delivered by cesarean	21.2%	20.8%	21.8%	21.8%	20.5%	20.1%	21.2%	20.8%
Prenatal care beginning during first trimester	82.8%	83.5%	68.3%	70.3%	68.9%	70.4%	80.2%	81.2%
Maternal age	**Rates ****							
10–14 years	0.8	0.8	4.6	4.2	2.7	2.7	1.4	1.3
15–19 years	51.1	50.3	104.5	95.5	107.7	106.2	58.9	56.9
20–24 years	106.2	106.6	146.0	136.5	188.2	186.9	111.1	110.0
25–29 years	115.5	115.2	104.0	97.7	153.2	151.8	113.9	112.4
30–34 years	83.2	84.7	65.8	63.4	95.4	94.2	81.5	82.5
35–39 years	33.7	34.3	28.9	28.3	44.3	43.9	33.7	34.1
40–44 years	6.2	6.3	5.9	5.9	10.7	10.5	6.4	6.5
45–49 years	0.3	0.3	0.3	0.2	0.6	0.5	0.3	0.3
15–44 years††	**64.9**	**64.5**	**76.9**	**71.7**	**105.6**	**103.7**	**66.7**	**65.6**

*The full preliminary report provides birth rates for American Indians/Alaskan Natives and Asians/Pacific Islanders (*3*); percentages for these races by characteristics will be available in the final report.
†Persons of Hispanic origin may be of any race.
§Includes races other than white and black.
¶Birthweight of <2500 grams (<5 lb 8 oz).
**Per 1000 population in specified group.
††Rates computed by relating total births, regardless of age of mother, to women aged 15–44 years.

TABLE 2. Preliminary number of deaths and death rates for the 15 leading causes of death for all ages, races, and sexes, by rank — United States, 1995

Rank*	Causes of death (ICD-9† code)	No.	Crude death rate§	Age-adjusted death rate¶	% Change 1994 to 1995**
1	Diseases of heart (390–398, 402, 404–429)	738,781	281.2	138.2	– 1.6
2	Malignant neoplasms, including neoplasms of lymphatic and hematopoietic tissues (140–208)	537,969	204.7	129.8	– 1.3
3	Cerebrovascular diseases (430–438)	158,061	60.2	26.7	0.8
4	Chronic obstructive pulmonary diseases and allied conditions (490–496)	104,756	39.9	21.2	1.0
5	Accidents and adverse effects (E800–E949)††	89,703	34.1	29.2	– 3.6
6	Pneumonia and influenza (480–487)	83,528	31.8	13.0	0
7	Diabetes mellitus (250)	59,085	22.5	13.2	2.3
8	Human immunodeficiency virus infection (042–044)§§	42,506	16.2	15.4	0
9	Suicide (E950–E959)	30,893	11.8	11.0	– 1.8
10	Chronic liver disease and cirrhosis (571)	24,848	9.5	7.5	– 5.1
11	Nephritis, nephrotic syndrome, and nephrosis (580–589)	23,845	9.1	4.4	2.3
12	Homicide and legal intervention (E960–E978)	21,577	8.2	8.8	–14.6
13	Septicemia (038)	21,123	8.0	4.1	2.5
14	Alzheimer's disease (331)	20,415	7.8	2.7	8.0
15	Atherosclerosis (440)	16,781	6.4	2.3	0
	All Causes	**2,312,180**	**880.0**	**503.7**	**– 0.7**

* Based on number of deaths.
† *International Classification of Diseases, Ninth Revision*.
§ Per 100,000 population.
¶ Per 100,000 U.S. standard million population.
** Percentage change between 1995 estimated age-adjusted death rates and 1994 final age-adjusted death rates.
†† When a death occurs under "accidental" circumstances, the preferred term within the public health community is "unintentional injury."
§§ These codes are not part of ICD-9, but were introduced by CDC's National Center for Health Statistics for classifying and coding human immunodeficiency virus infection (*2*).

Births and Deaths — Continued

certificate data are processed in two parts: estimates of demographic characteristics are based on approximately 90% of 1995 deaths and medical (cause-of-death) estimates are based on approximately 80% of deaths. CDC receives independent monthly counts of birth and death records from state vital statistics offices. To produce the estimates in this report, the records from the preliminary files were weighted to these independent counts of births, infant deaths, and total deaths registered during 1995. Differences between the preliminary estimates and the final mortality data are likely to be greatest for causes for which reporting of deaths was delayed (e.g., when the case was referred to a coroner or medical examiner for investigation).

Births

In 1995, the preliminary birth rate for teenagers (56.9 births per 1000 females aged 15–19 years) declined 3% from 1994 and sustained a decline since 1991. Rates declined up to 3% for white, American Indian/Alaska Native, Asian/Pacific Islander, and Hispanic teenagers, and 9% for black teenagers. From 1994 to 1995, declines also occurred in the number and proportion of births to unmarried mothers—the number declined 3% to an estimated 1,248,028, and the proportion from 32.6% to 32.0%. For the first time since 1976, the birth rate for unmarried women aged 15–44 years declined—from 46.9 per 1000 in 1994 to 44.9 in 1995, a 4% decline. In addition, 1995 was the first year since 1940 (when national statistics first became available) during which concurrent declines occurred in the number, rate, and proportion of births to unmarried women. Compared with 1994, the 1995 proportions of births to unmarried women for whites and blacks declined by approximately 1%, and for Hispanics, by 5%. In 1995, the incidence of low birthweight (birthweight of <2500 grams [<5 lb 8 oz]) was unchanged from 1994 (7.3%); the proportion of births by cesarean delivery (20.8%) declined for the sixth consecutive year, and the proportion of mothers beginning prenatal care during the first trimester (81.2%) increased for the sixth consecutive year.

Deaths

In 1995, although the preliminary crude death rate (880.0 deaths per 100,000 population) increased slightly from 1994 (875.4), the age-adjusted death rate* was a record low (503.7). The overall estimated life expectancy in 1995 (75.8 years) increased slightly from 1994 (75.7) and equaled the record high for 1992. Record highs were reached for black females (74.0 years), black males (65.4), and white males (73.4). The life expectancy for white females was 79.6 years, unchanged from the previous year and slightly below the record high (79.8) in 1992.

From 1994 to 1995, the age-adjusted death rate for the two leading causes of death continued to decline—heart disease mortality by 1.6% and cancer mortality by 1.3%. Preliminary age-adjusted death rates also declined for homicide by 14.6%, chronic liver disease and cirrhosis by 5.1%, and mortality attributed to accidents† (including motor-vehicle and other injuries) by 3.6%. For the first time since human immunodeficiency virus (HIV) infection was included in U.S. death statistics, the age-adjusted

*Age-adjusted death rates adjust for differing age distributions of population groups and are more effective for comparing relative risks for mortality among groups and over time. They should be used as relative indexes rather than as actual measures of risk. The age-adjusted rates were computed using the U.S. standard million population.

†When a death occurs under "accidental" circumstances, the preferred term within the public health community is "unintentional injury."

Births and Deaths — Continued

rates for HIV-related deaths—the leading cause of death among persons aged 25–44 years—did not increase. Age-adjusted death rates declined for suicides, injuries from firearms, drug and alcohol-induced causes, and workplace-related injuries. Age-adjusted death rates increased from 1994 to 1995 for diabetes by 2.3% and for Alzheimer's disease by 8.0%.

From 1994 to 1995, declines occurred in overall infant mortality, neonatal mortality (age <28 days), and postneonatal mortality (age 28 days through 11 months) for both white and black infants. The preliminary infant mortality rate in 1995 (7.5 deaths per 1000 live births) was lower than in 1994 (8.0).

Reported by: Div of Vital Statistics, National Center for Health Statistics, CDC.

Editorial Note: The data from the new system for releasing vital statistics provides an earlier indication of potential shifts in trends and has important ramifications for planning public health program policies and strategies. Preliminary data about live births and deaths for 1995 are available almost a year in advance of the release of the final data. CDC plans to improve the timeliness by releasing statistics based on these preliminary files twice a year (*4*). Each release will be based on data for a 12-month period beginning in either January or July. Statistics for January 1995–December 1995 were released on October 4, 1996. The next release, scheduled for April 1997, will cover July 1995–June 1996.

In previous years, full-year provisional mortality estimates released by NCHS have been based on a 10% sample of death certificates. However, the new data system combines expedited electronic transmittal of data from the states with more rapid data processing within NCHS to make available preliminary data for the full year based on 80%–90% of records. Although the preliminary data are based on substantial samples of births and deaths, statistics based on the final data will differ from the preliminary in some cases. In particular, the final 1995 infant mortality rate probably will exceed the rate based on preliminary data but will remain less than the 1994 rate (8.0). In addition, estimates based on final data for certain causes of death (e.g., homicide and unintentional injury) may be higher than estimates based on preliminary data.

Changes in methodologic procedures also can contribute to year-to-year differences. For example, approximately half of the 1995 decline in unmarried childbearing is the result of changes in reporting procedures in California, which particularly affected births to Hispanic women. Beginning in 1995, reporting procedures in California more accurately ascertain the marital status of Hispanic mothers than in 1994 and prior years. However, even when these reporting changes were taken into account, the 1995 decline is significant. Changes in diagnostic practices also may have accounted for the increase in the death rate for Alzheimer's disease. Finally, the earlier release of more accurate natality and mortality data should assist efforts to prolong and improve the quality of life and to prevent disease, injury, and premature death.

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Adult Blood Lead Epidemiology and Surveillance — United States, Second Quarter, 1996

CDC's National Institute for Occupational Safety and Health Adult Blood Lead Epidemiology and Surveillance program (ABLES) monitors laboratory-reported elevated blood lead levels (BLLs) among adults in the United States. This report presents ABLES data through the second quarter of 1996 and compares these data with the second quarter of 1995.

During April 1–June 30, 1996, the 6305 reports of BLLs ≥25 μg/dL represented a 7% decrease from the 6782 reports for the second quarter of 1995 (*1*), which now include previously unpublished data for Minnesota and an estimate for Ohio. For the first 2 quarters of 1996, the number of reports of BLLs ≥25 μg/dL decreased by 9% compared with the number reported for the first 2 quarters of 1995 (*1*), which also include previously unpublished data for Minnesota and an estimate for Ohio (Table 1). The cumulative number of reports in 1996 decreased at each reporting level compared with data for 1995. This overall trend of decreasing reports is consistent with the first quarter report for 1996 (*2*).

Reported by: JP Lofgren, MD, Alabama Dept of Public Health. K Schaller, Arizona Dept of Health Svcs. S Payne, MA, Occupational Lead Poisoning Prevention Program, California Dept of Health Svcs. BC Jung, MPH, Connecticut Dept of Public Health. M Lehnherr, Occupational Disease Registry, Div of Epidemiologic Studies, Illinois Dept of Public Health. R Gergely, Iowa Dept of Public Health. A Hawkes, MD, Occupational Health Program, Maine Bur of Health. E Keyvan-Larijani, MD, Lead Poisoning Prevention Program, Maryland Dept of the Environment. R Rabin, MSPH, Div of Occupational Hygiene, Massachusetts Dept of Labor and Industries. M Scoblic, MN, Michigan Dept of Public Health. M Falken, PhD, Minnesota Dept of Health. L Thistle-Elliott, MEd, Div of Public Health Svcs, New Hampshire State Dept of Health and Human Svcs. B Gerwel, MD, Occupational Disease Prevention Project, New Jersey State Dept of Health. R Stone, PhD, New York State Dept of Health. S Randolph, MSN, North Carolina Dept of Environment, Health, and Natural Resources. A Migliozzi, MSN, Bur of Health Risk Reduction, Ohio Dept of Health. E Rhoades, MD, Oklahoma State Dept of Health. A Sandoval, MS, State Health Div, Oregon Dept of Human Resources. J Gostin, MS, Occupational Health Program, Div of Environmental Health, Pennsylvania Dept of Health. R Marino, MD, Div of Health Hazard Evaluations, South Carolina Dept of Health and Environmental Control. P Schnitzer, PhD, Bur of Epidemiology, Texas Dept of Health. W Ball, PhD, Bur of Epidemiology, Utah Dept of Health. L Toof, Div of Epidemiology and Health Promotion, Vermont Dept of Health. J Kaufman, MD, Washington State Dept of Labor and Industries. J Tierney, Wisconsin Dept of Health and Social Svcs. Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

Adult Blood Lead Epidemiology and Surveillance — Continued

TABLE 1. Number of reports of elevated blood lead levels (BLLs) among adults, number of adults with elevated BLLs, and percentage change in number of reports — 25 states,* second quarter, 1996

Reported BLL (μg/dL)	Second quarter, 1996		Cumulative reports, 1995¶	Cumulative reports, 1996	% Change 1995–1996
	No. reports†	No. persons§			
25–39	5,024	3,508	10,527	9,978	– 5%
40–49	959	674	2,697	2,111	–22%
50–59	224	159	554	431	–22%
≥60	98	55	236	200	–15%
Total	**6,305**	**4,396**	**14,014**	**12,720**	**– 9%**

*Alabama, Arizona, California, Connecticut, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Utah, Vermont, Washington, and Wisconsin.

†Data for Alabama were missing; first quarter 1995 data were used as an estimate.

§Individual reports for persons are categorized according to the highest reported BLL for the person during the given quarter. Pennsylvania provides the number of reports but no information on persons. The data on persons from Pennsylvania included in this table are estimates based on the proportions from the other 24 states combined and the number of reports received from Pennsylvania. Data for Alabama were missing; first quarter 1995 data were used as an estimate.

¶Data for Minnesota and Ohio are included for the first time in addition to previously published 1995 totals (*1*). For Minnesota, first and second quarter data for 1995 were used; for Ohio, first and second quarter data for 1996 were used as an estimate.

Editorial Note: The findings in this report suggest that exposure to lead may be decreasing; however, variation in national quarterly reporting totals may result from 1) changes in the number of participating states; 2) changes in staffing and funding in state-based surveillance programs; and 3) interstate differences in worker BLL testing by lead-using industries. ABLES data also may be underreported when compared to estimates of the number of adults exposed to lead derived from the Third National Health and Nutrition Examination Survey (*3*).

The findings in this report document the continuing hazard of work-related lead exposures as an occupational health problem in the United States. ABLES enhances surveillance for this preventable condition by expanding the number of participating states, reducing variability in reporting, and distinguishing between new and recurring elevated BLLs in adults.

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Notice to Readers

Clinical Update: Impact of HIV Protease Inhibitors on the Treatment of HIV-Infected Tuberculosis Patients with Rifampin

In 1995 and 1996, the Food and Drug Administration (FDA) approved three products in the new protease inhibitor class of drugs—saquinavir (Invirase™), ritonavir (Norvir™), and indinavir (Crixivan™). Another drug in this class of agents, nelfinavir (Viracept™) (Agouron Pharmaceuticals), is expected to be available soon from the manufacturer through an expanded-access program. All four drugs, which inhibit HIV protease and thus interfere with viral maturation and replication, are the most potent antiretroviral agents available to treat patients with HIV disease (*1*). However, these protease inhibitors interact with rifamycin derivatives, such as rifampin and rifabutin, which are used to treat and prevent the mycobacterial infections commonly observed in HIV-infected patients. Rifamycins accelerate the metabolism of protease inhibitors (through induction of hepatic P450 cytochrome oxidases), resulting in subtherapeutic levels of the protease inhibitors. In addition, protease inhibitors retard the metabolism of rifamycins, resulting in increased serum levels of rifamycins and the likelihood of increased drug toxicity (*2*). This report describes approaches for managing patients who are candidates for or who are undergoing protease inhibitor therapy when tuberculosis (TB) is diagnosed and presents interim recommendations for managing these patients until additional data are available and formal guidelines are issued.

BACKGROUND

Rifampin is an essential component of the currently recommended regimen for treating TB (*3*). This regimen is efficacious in treating HIV-infected patients with TB and consists of isoniazid and rifampin for a minimum of 6 months, plus pyrazinamide and either ethambutol or streptomycin for the first 2 months (*4,5*). Therefore, the pharmacokinetic interactions between protease inhibitors and rifampin are important for health-care workers involved in TB control and the care of patients co-infected with TB and HIV because clinicians may decrease or restrict the use of rifampin in the treatment of patients who are candidates for therapy with both protease inhibitors and rifampin. Prompt initiation of appropriate drug therapy for patients with HIV infection who acquire TB is critical because TB may be rapidly fatal (*6*). Drug therapy is a critical personal health measure for curing TB and minimizes the impact of this disease on the progression of HIV infection; in addition, drug therapy is a major public health measure for interrupting the transmission of *Mycobacterium tuberculosis* to persons in the community.

Currently, the manufacturers' product labeling for protease inhibitors contraindicates, does not recommend, or discourages the concurrent administration of rifampin and protease inhibitors. Because of the common association of TB and HIV infection, an increasing number of patients probably will be considered candidates for rifampin and protease inhibitors. The management of these patients is complex, requires an individualized approach, and should be undertaken only by or in consultation with an expert. In addition, all HIV-infected patients at risk for TB infection should be carefully evaluated and administered isoniazid for preventive treatment if indicated, regardless of their status for being prescribed protease inhibitor therapy.

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MANAGEMENT OPTIONS

TB Management for Patients for Whom Protease Inhibitor Therapy Is Being Considered but Has Not Yet Been Initiated

For HIV-infected patients diagnosed with drug-susceptible TB and for whom protease inhibitor therapy is being considered but has not been initiated, the suggested management strategy is to complete TB treatment with a regimen containing rifampin before starting therapy with a protease inhibitor. The duration of this anti-TB regimen is at least 6 months, and therapy should be administered following current guidelines published by the American Thoracic Society and CDC (*3*), including the recommendation to carefully assess clinical and bacteriologic response in patients co-infected with HIV and to prolong treatment if response is slow or suboptimal. Antiretroviral agents other than protease inhibitors may be used concurrently with this regimen. Directly observed therapy (DOT) is routinely recommended for the treatment of TB to ensure adherence with the recommended regimen and is available through local health department TB-control programs. Among patients who adhere to therapy, four-drug regimens are expected to be effective even in those infected with strains of *M. tuberculosis* resistant to isoniazid or streptomycin alone. However, the management of patients with drug-resistant TB should be evaluated on a case-by-case basis and individualized based on the results of drug-susceptibility studies.

TB Management Options for Patients Undergoing Protease Inhibitor Therapy

There are three options for managing HIV-infected patients with TB who are undergoing protease inhibitor therapy when TB is diagnosed. One option is to discontinue therapy with the protease inhibitor while undergoing a TB treatment regimen that includes rifampin. However, because of the potential that interruptions in the administration of the prescribed protease inhibitor can induce HIV resistance to the protease inhibitor and possibly to other drugs within the protease inhibitor class (*1*) and because discontinuation of protease inhibitor therapy may be associated with a detrimental effect on the patient's clinical status, some clinicians may be reluctant to discontinue protease inhibitor therapy for the duration of TB treatment. In such cases, two additional options may be considered. Because the risks and benefits of all these options are unknown, clinicians should individualize management decisions on a case-by-case basis to provide optimal patient care.

Option I. This option involves discontinuing therapy with the protease inhibitor and completing a short (minimum 6 months) course of TB treatment with a regimen containing rifampin. This anti-TB regimen should be administered following current guidelines published by the American Thoracic Society and CDC (*3*), and the duration of therapy should be prolonged in patients with slow or suboptimal responses. Protease inhibitor therapy may be resumed when treatment with rifampin is discontinued. Antiretroviral agents other than protease inhibitors may be used concurrently with rifampin. Although the risks associated with a complete discontinuation of protease inhibitor therapy while undergoing TB treatment are unclear, they may be serious; however, the risks and complications associated with TB treatment regimens that do not include rifampin are known. Potential consequences include prolonged duration of therapy to at least 18–24 months, increased likelihood of treatment failure and mortality (*7,8*), slower conversion of sputum culture to negative with patients remaining infectious for longer periods of time, and the adverse effect of TB disease on the

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progression of HIV infection (*9,10*). Therefore, nonrifampin-containing regimens are not recommended for the treatment of rifampin-susceptible TB.

Option II. To minimize the interruption of protease inhibitor therapy, one option is to use a four-drug TB treatment regimen that includes rifampin (i.e., daily isoniazid, pyrazinamide, rifampin, and ethambutol or streptomycin) for a minimum of 2 months and until bacteriologic response is achieved (i.e., sputum conversion to culture-negative status), and the results from susceptibility testing are available. After bacteriologic response and drug susceptibility have been documented (usually 3 months), treatment may be modified to a 16-month continuation-phase regimen consisting of isoniazid (15 mg/kg) and ethambutol (50 mg/kg) two times per week. This regimen allows the reintroduction of protease inhibitor therapy. Some experts consulted for this report recommended adding a third drug, such as streptomycin, during this continuation phase if the infecting organism is not resistant to the drug. Option II cannot be recommended for patients with proven isoniazid-resistant TB.

Option III. The other management option is to continue protease inhibitor therapy with indinavir (800 mg every 8 hours) and administer a four-drug, 9-month TB-treatment regimen containing daily rifabutin (150 mg/day) instead of rifampin. When this option is used for TB management, clinicians should conduct careful monitoring, possibly including measuring serum concentrations of rifabutin—a service available only in specialized centers in the United States. This alternative TB therapy is recommended based on the pharmacokinetic characteristics of rifabutin and limited data from clinical trials. Rifabutin is a rifamycin derivative with comparable anti-TB activity in vitro but with less hepatic P450 cytochromic enzyme-inducing effect than rifampin (*11,12*). An international multicenter study indicated that a 6-month regimen containing rifabutin, at the daily dose of either 150 mg or 300 mg, was as effective for treating TB as a similar regimen containing rifampin (*13*). In a small clinical trial, a rifabutin-containing regimen was effective in treating TB in patients co-infected with HIV (*14*). In addition, limited data from pharmacokinetic studies suggest that the combination of rifabutin at 150 mg/day and indinavir resulted in acceptable levels of both drugs (*15*). Option III cannot be recommended for patients undergoing therapy with ritonavir or saquinavir. For these patients, the decision to change the prescribed protease inhibitor to indinavir and to prescribe rifabutin for TB therapy should be made in consultation with an expert in the use of protease inhibitors to manage HIV infection. In the United States, rifabutin is approved by FDA for the prevention of disease caused by *M. avium* complex (MAC) but not for the treatment or prevention of TB.

ADDITIONAL RECOMMENDATIONS

Neither option II nor option III have been studied in large clinical trials of HIV-infected patients or patients undergoing protease inhibitor therapy during TB treatment. For these reasons, if either of these options are selected for managing patients with TB, CDC recommends the following interim guidelines until additional data are available and formal guidelines are issued: 1) on initiation of therapy, perform frequent bacteriologic evaluations to document sputum conversion to culture-negative status, and after culture conversion, to detect any possible treatment failures, 2) extend the duration of therapy to at least 18 months for option II or 9 months for option III, 3) use only indinavir with option III, 4) carefully monitor for drug toxicity, 5) use DOT throughout, and 6) reevaluate periodically during the first 2 years after comple-

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tion of therapy (including an assessment of bacteriologic status at six months) and instruct patients to promptly report symptoms compatible with relapse of TB disease. The management of HIV-infected patients diagnosed with drug-resistant TB or diagnosed clinically with TB but without culture and susceptibility-testing results should be evaluated on a case-by-case basis and performed in consultation with a TB expert.

CONCLUSIONS

In the future, concurrent use of protease inhibitors with rifampin might be possible by modifying the doses of both to compensate for the drug interaction. For example, based on limited data submitted to FDA during the new drug application review for ritonavir, a slight increase in the dosage of ritonavir and a reduction by half in the dosage of rifampin may have resulted in satisfactory levels of both drugs. However, this option cannot be recommended until data from larger, more detailed studies are available and will require careful monitoring of the serum levels of rifampin.

Interactions between protease inhibitors and the rifamycins also have complicated prophylaxis and treatment for disseminated MAC disease. Rifabutin is one of the drugs recommended for MAC prophylaxis (*16*). According to the manufacturer of indinavir, rifabutin at half the dose (150 mg) can be used for MAC prophylaxis simultaneously with indinavir. Other options for MAC prophylaxis are clarithromycin and azithromycin (*17,18*), two macrolide antibiotics approved by FDA for this purpose and for which interactions with protease inhibitors are expected to be less of an issue. In November 1996, a joint working group of the Public Health Service and Infectious Disease Society of America will update recommendations for MAC prophylaxis.

To reduce the likelihood of drug interactions while providing optimal anti-TB care for HIV-infected persons, health-care workers involved in the care of patients with TB and health-care workers involved in HIV clinical care are encouraged to coordinate efforts and thus ensure the best possible outcome for these patients. CDC's Research and Evaluation Branch, Division of Tuberculosis Elimination, National Center for HIV, STD, and TB Prevention, (telephone [404) 639-8123]) requests the inclusion of clinical information in the comments section of TB surveillance reports from private practitioners or health department staff who manage HIV-infected patients undergoing protease inhibitor therapy when TB is diagnosed.

Reported by: Center for Drug Evaluation and Research, Food and Drug Administration. Div of Tuberculosis Elimination, and Div of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention, CDC.

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Erratum: Vol. 45, No. 40

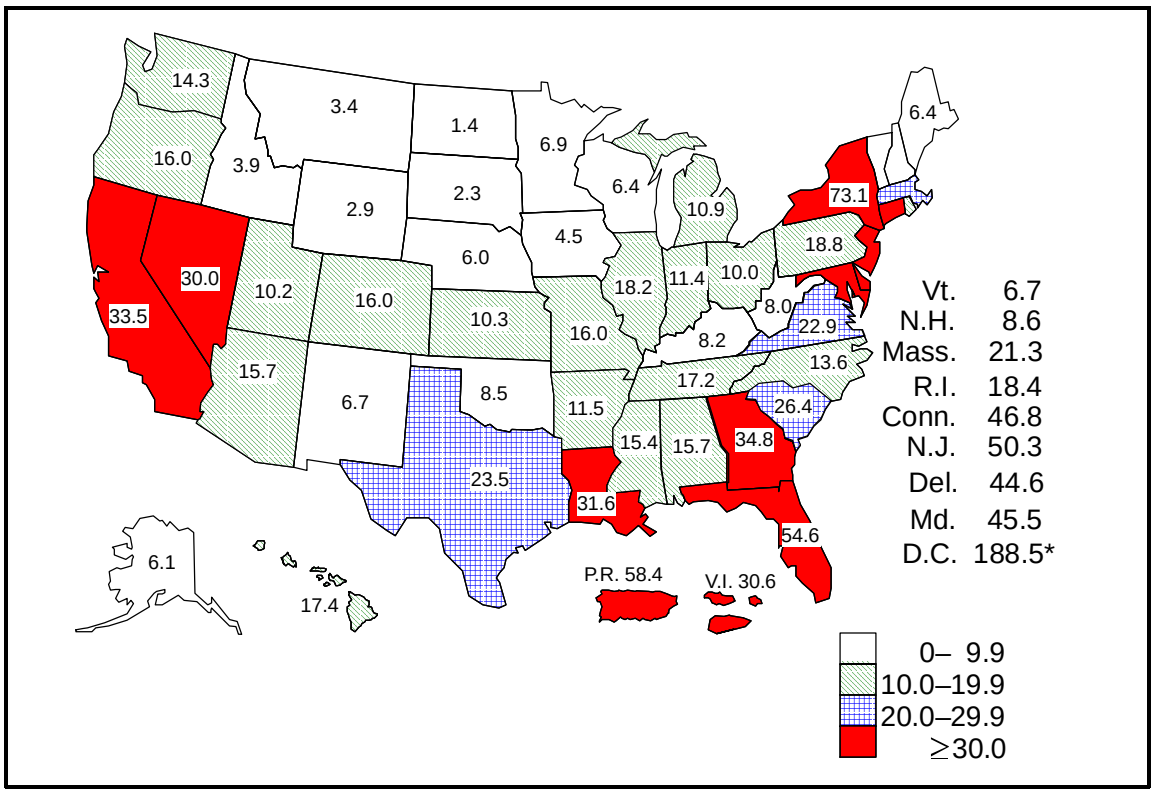
In the box, "National Adult Immunization Awareness Week—October 20–26, 1996," on page 853, the World Wide Web site given for the National Coalition for Adult Immunization is incorrect. The correct site is http://www.medscape.com/ncai.

AIDS Rates

The following map provides information about the reported number of acquired immunodeficiency syndrome (AIDS) cases per 100,000 population, by state of residence from July 1995 through June 1996. The accompanying table lists the metropolitan areas with the 50 highest annual rates of AIDS per 100,000 population.

More detailed information about AIDS cases is provided in the *HIV/AIDS Surveillance Report*, single copies of which are available from the CDC National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20849-6003; telephone (800) 458-5231 or (301) 217-0023. Internet users can view an electronic copy of the report by accessing CDC's World Wide Web home page (http://www.cdc.gov), then selecting "Publications & Products."

AIDS annual rates per 100,000 population — United States, July 1995–June 1996



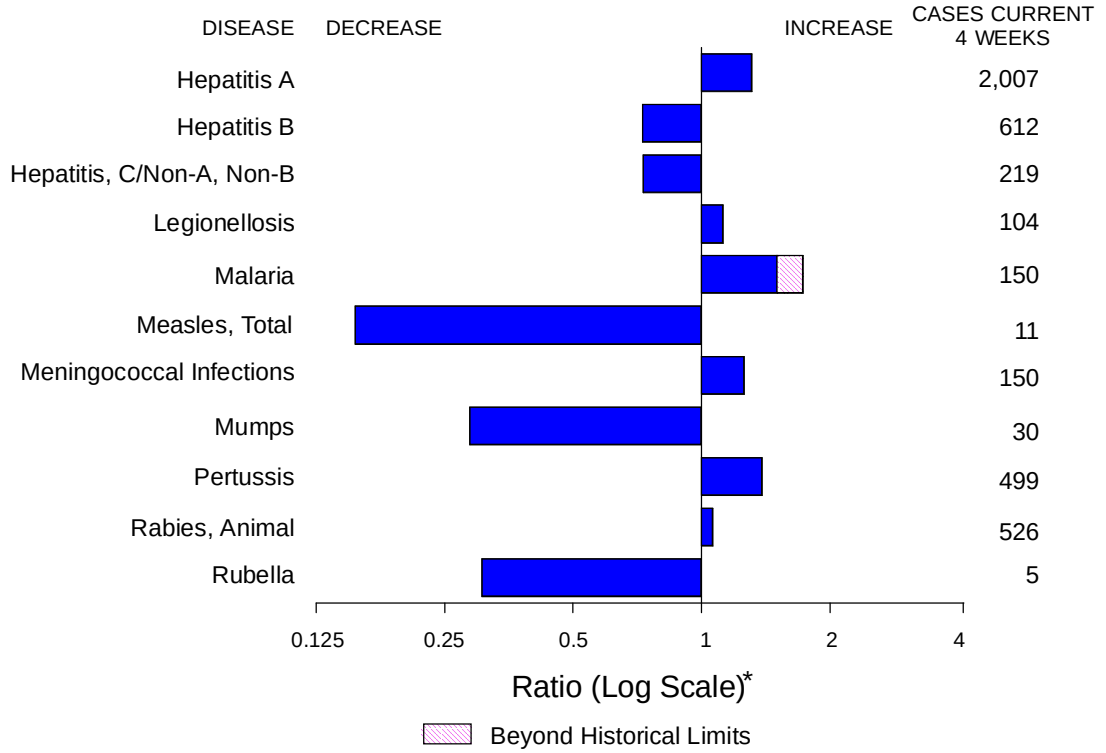
*This rate represents only persons residing within the geographic boundaries of the District and differs from the rate for the larger Washington, D.C., metropolitan area (see table).

Metropolitan areas* with the 50 highest AIDS annual rates per 100,000 population — United States, July 1995–June 1996

Metropolitan area of residence	Rate	Metropolitan area of residence	Rate
New York, N.Y.	132.0	Dallas, Tex.	34.1
Miami, Fla.	117.3	Las Vegas, Nev.	33.0
Jersey City, N.J.	115.2	Middlesex, N.J.	30.8
San Francisco, Calif.	109.8	Oakland, Calif.	30.4
Fort Lauderdale, Fla.	86.7	Richmond, Va.	30.1
West Palm Beach, Fla.	86.4	Rochester, N.Y.	29.8
Newark, N.J.	79.1	Austin, Tex.	29.6
San Juan, Puerto Rico	67.0	Springfield, Mass.	28.5
Baltimore, Md.	61.5	Memphis, Tenn.	28.3
New Orleans, La.	55.8	Monmouth-Ocean, N.J.	27.4
New Haven, Conn.	53.2	Nashville, Tenn.	26.9
Atlanta, Ga.	51.6	San Antonio, Tex.	25.6
Wilmington, Del.	50.2	Charleston, S.C.	25.3
Hartford, Conn.	46.2	Seattle, Wash.	24.7
Washington, D.C.	45.8	Denver, Colo.	24.4
San Diego, Calif.	43.4	Albany-Schenectady, N.Y.	24.4
Los Angeles, Calif.	42.9	Nassau-Suffolk, N.Y.	24.1
Orlando, Fla.	42.6	Birmingham, Ala.	24.0
Jacksonville, Fla.	39.6	Chicago, Ill.	23.4
Baton Rouge, La.	39.2	Sarasota, Fla.	23.4
Bergen-Passaic, N.J.	37.5	Indianapolis, Ind.	22.8
Houston, Tex.	35.9	Riverside-San Bernardino, Calif.	22.5
Norfolk, Va.	35.3	Bakersfield, Calif.	22.2
Tampa-Saint Petersburg, Fla.	34.6	Mobile, Ala.	21.1
Philadelphia, Pa.	34.3	Kansas City, Mo.	20.7
		Portland, Ore.	20.7

*Includes only metropolitan areas with a population ≥500,000. Metropolitan areas are named for a central city or county, may include several cities and counties, and may cross state boundaries.

FIGURE I. Selected notifiable disease reports, comparison of provisional 4-week totals ending October 19, 1996, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — provisional cases of selected notifiable diseases, United States, cumulative, week ending October 19, 1996 (42nd Week)

	Cum. 1996		Cum. 1996
Anthrax	-	HIV infection, pediatric*§	216
Brucellosis	64	Plague	2
Cholera	3	Poliomyelitis, paralytic¶	-
Congenital rubella syndrome	1	Psittacosis	35
Cryptosporidiosis*	1,758	Rabies, human	1
Diphtheria	1	Rocky Mountain spotted fever (RMSF)	591
Encephalitis: California*	84	Streptococcal toxic-shock syndrome*	13
eastern equine*	2	Syphilis, congenital**	225
St. Louis*	-	Tetanus	23
western equine*	-	Toxic-shock syndrome	107
Hansen Disease	88	Trichinosis	16
Hantavirus pulmonary syndrome*†	15	Typhoid fever	291

-: no reported cases
*Not notifiable in all states.
† Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (NCID).
§ Updated monthly to the Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention (NCHSTP), last update September 24, 1996.
¶ Three suspected cases of polio with onset in 1996 has been reported to date.
**Updated quarterly from reports to the Division of STD Prevention, NCHSTP.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending October 19, 1996, and October 21, 1995 (42nd Week)

Reporting Area	AIDS*		Chlamydia	*Escherichia coli* O157:H7		Gonorrhea		Hepatitis C/NA,NB		Legionellosis	
				NETSS†	PHLIS§						
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	51,611	57,393	305,921	2,201	1,191	237,839	318,083	2,690	3,231	739	958
NEW ENGLAND	2,065	2,824	13,447	302	75	5,648	6,182	96	104	57	30
Maine	32	82	707	21	-	49	73	-	-	2	5
N.H.	66	77	397	37	36	80	93	8	12	3	2
Vt.	18	28	U	30	29	42	49	32	11	4	-
Mass.	997	1,235	5,649	138	10	1,808	2,189	50	74	26	19
R.I.	129	187	1,552	15	-	416	427	6	7	22	4
Conn.	823	1,215	5,142	61	-	3,253	3,351	-	-	N	N
MID. ATLANTIC	14,243	15,909	34,507	193	42	26,439	35,139	253	367	184	163
Upstate N.Y.	1,855	1,832	N	132	15	5,381	7,521	200	187	60	43
N.Y. City	7,855	8,405	15,878	12	-	8,618	14,166	1	1	7	5
N.J.	2,905	3,770	4,161	49	5	3,971	3,327	-	143	12	24
Pa.	1,628	1,902	14,468	N	22	8,469	10,125	52	36	105	91
E.N. CENTRAL	4,076	4,229	65,707	512	342	45,630	64,056	372	270	195	283
Ohio	871	877	14,523	149	84	10,460	19,974	32	12	84	127
Ind.	498	423	8,368	72	48	5,428	7,521	8	4	39	69
Ill.	1,808	1,727	19,613	202	84	14,408	16,514	58	73	9	29
Mich.	685	916	16,107	89	68	11,893	14,660	274	181	46	27
Wis.	214	286	7,096	N	58	3,441	5,387	-	-	17	31
W.N. CENTRAL	1,221	1,286	22,204	512	324	9,961	16,230	102	69	40	68
Minn.	226	302	2,702	231	212	U	2,430	2	4	5	6
Iowa	72	91	3,486	107	81	914	1,295	44	13	9	19
Mo.	626	559	9,654	60	-	6,553	9,200	33	18	9	14
N. Dak.	10	4	2	15	15	-	26	-	5	-	3
S. Dak.	10	17	784	21	-	115	179	-	1	2	3
Nebr.	83	84	2,049	49	4	783	953	7	15	12	16
Kans.	194	229	3,527	29	12	1,596	2,147	16	13	3	7
S. ATLANTIC	13,079	14,724	44,113	119	60	77,226	88,536	212	202	121	152
Del.	232	265	1,148	1	2	1,181	1,828	1	-	11	2
Md.	1,961	2,226	5,608	N	8	11,762	10,718	1	7	26	24
D.C.	1,001	872	N	-	-	3,497	3,809	-	-	8	4
Va.	896	1,151	9,323	N	29	7,168	8,693	13	17	17	21
W. Va.	88	84	1	N	2	442	543	9	43	1	4
N.C.	677	837	-	37	12	15,166	19,681	43	47	9	31
S.C.	667	814	-	9	7	8,757	9,852	25	19	5	30
Ga.	1,867	1,791	9,554	30	-	14,852	16,682	U	15	3	14
Fla.	5,690	6,684	18,479	30	-	14,401	16,730	120	54	41	22
E.S. CENTRAL	1,749	1,817	24,264	57	52	25,993	33,044	461	822	39	50
Ky.	309	220	5,350	12	8	3,384	3,857	27	28	4	10
Tenn.	647	725	10,559	24	41	9,405	11,207	337	792	19	24
Ala.	470	520	6,759	10	3	10,817	13,578	5	2	3	6
Miss.	323	352	U	11	-	2,387	4,402	92	U	13	10
W.S. CENTRAL	5,138	5,070	32,328	62	12	24,548	44,919	381	273	18	20
Ark.	207	223	-	13	3	2,653	4,609	13	6	2	6
La.	1,177	849	6,101	6	4	6,547	8,938	175	151	1	3
Okla.	189	207	6,113	10	1	3,973	4,778	69	40	5	4
Tex.	3,565	3,791	20,114	33	4	11,375	26,594	124	76	10	7
MOUNTAIN	1,533	1,819	13,303	178	91	5,611	7,663	468	398	37	99
Mont.	33	20	-	23	-	25	59	14	13	1	4
Idaho	32	38	1,236	30	13	87	115	93	45	-	2
Wyo.	5	13	466	11	9	32	46	146	166	3	12
Colo.	406	571	-	63	36	1,077	2,323	49	60	7	35
N. Mex.	139	148	3,192	10	-	722	870	64	42	2	4
Ariz.	461	550	5,344	N	22	2,786	2,995	62	41	16	9
Utah	144	113	1,248	26	-	242	209	22	11	3	14
Nev.	313	366	1,817	15	11	640	1,046	18	20	5	19
PACIFIC	8,506	9,715	56,048	266	193	16,783	22,314	345	726	48	93
Wash.	538	779	7,459	85	72	1,640	2,218	48	186	6	20
Oreg.	359	374	U	66	37	494	628	6	34	1	-
Calif.	7,440	8,295	42,322	111	74	14,011	18,437	113	444	36	68
Alaska	28	62	964	4	2	349	558	3	1	1	-
Hawaii	141	205	1,075	N	8	289	473	175	61	4	5
Guam	4	-	168	N	-	31	89	1	6	2	1
P.R.	1,792	1,951	N	16	U	298	470	82	189	-	-
V.I.	17	30	N	N	U	-	-	-	-	-	-
Amer. Samoa	-	-	-	N	U	-	26	-	-	-	-
C.N.M.I.	1	-	N	N	U	11	51	-	5	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly to the Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention, last update September 24, 1996.

†National Electronic Telecommunications System for Surveillance.

§Public Health Laboratory Information System.

TABLE II. (Cont'd.) Provisional cases of selected notifiable diseases, United States, weeks ending October 19, 1996, and October 21, 1995 (42nd Week)

Reporting Area	Lyme Disease		Malaria		Meningococcal Disease		Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995
UNITED STATES	11,266	9,154	1,191	1,079	2,582	2,449	8,817	13,325	15,003	16,989	5,496	6,417
NEW ENGLAND	3,518	1,777	47	42	113	116	148	296	341	402	600	1,285
Maine	43	24	7	6	12	9	-	2	21	11	89	46
N.H.	42	22	2	1	5	20	1	1	11	16	51	129
Vt.	15	8	4	1	4	9	-	-	1	2	123	151
Mass.	292	119	18	14	44	39	67	51	171	225	94	378
R.I.	430	295	6	4	13	5	3	3	27	40	33	282
Conn.	2,696	1,309	10	16	35	34	77	239	110	108	210	299
MID. ATLANTIC	6,729	5,998	330	292	232	303	347	681	2,692	3,489	1,168	1,642
Upstate N.Y.	3,463	3,053	72	54	70	83	62	72	335	416	874	969
N.Y. City	252	371	172	161	32	44	106	302	1,315	1,953	-	-
N.J.	1,393	1,552	59	58	55	70	77	136	602	623	109	289
Pa.	1,621	1,022	27	19	75	106	102	171	440	497	185	384
E.N. CENTRAL	67	390	110	140	345	347	1,271	2,290	1,633	1,597	85	92
Ohio	41	25	13	11	129	97	470	729	240	217	11	12
Ind.	23	16	13	16	54	49	173	267	143	145	7	14
Ill.	3	16	35	71	92	89	347	884	851	831	23	15
Mich.	-	5	36	21	38	65	142	238	309	330	31	37
Wis.	U	328	13	21	32	47	139	172	90	74	13	14
W.N. CENTRAL	137	159	43	24	208	155	289	626	385	469	445	313
Minn.	59	80	19	4	25	26	51	37	88	114	25	25
Iowa	20	12	3	3	41	29	16	39	53	52	207	110
Mo.	22	43	9	8	88	57	189	513	160	179	17	28
N. Dak.	1	-	1	1	3	1	-	-	6	3	56	24
S. Dak.	-	-	-	2	9	6	-	-	17	20	105	82
Nebr.	5	5	3	3	19	14	11	11	13	20	5	5
Kans.	30	19	8	3	23	22	22	26	48	81	30	39
S. ATLANTIC	566	563	250	212	527	410	3,075	3,339	2,865	2,953	2,288	1,795
Del.	78	38	3	1	2	6	34	14	20	49	61	81
Md.	331	374	69	55	66	36	533	388	242	320	518	347
D.C.	3	3	7	16	10	6	115	92	110	87	9	11
Va.	44	48	39	50	49	56	328	497	234	202	502	366
W. Va.	11	22	5	4	11	8	3	9	50	59	82	101
N.C.	62	49	25	15	66	68	887	926	407	357	594	398
S.C.	6	16	11	1	49	52	314	485	281	263	74	109
Ga.	1	10	26	27	122	79	545	621	521	576	246	238
Fla.	30	3	65	43	152	99	316	307	1,000	1,040	202	144
E.S. CENTRAL	57	63	26	23	184	172	2,004	2,748	1,034	1,175	173	244
Ky.	15	13	3	3	25	39	122	150	186	258	36	25
Tenn.	19	28	13	9	50	67	654	718	312	352	66	83
Ala.	6	7	3	8	62	35	457	530	346	338	68	127
Miss.	17	15	7	3	47	31	771	1,350	190	227	3	9
W.S. CENTRAL	99	96	38	48	293	289	1,181	2,679	1,778	2,441	322	534
Ark.	23	7	-	2	33	29	124	412	158	195	21	41
La.	2	7	6	5	50	43	429	830	59	228	13	24
Okla.	20	40	-	1	32	32	151	155	137	321	27	28
Tex.	54	42	32	40	178	185	477	1,282	1,424	1,697	261	441
MOUNTAIN	7	12	52	53	149	177	112	178	503	533	132	160
Mont.	-	-	7	3	5	2	-	4	14	10	20	41
Idaho	1	-	-	1	22	10	4	-	7	12	-	3
Wyo.	2	3	7	-	3	8	2	1	6	4	26	24
Colo.	-	-	22	23	32	44	23	96	72	59	41	9
N. Mex.	1	1	2	5	23	32	1	6	67	66	6	6
Ariz.	-	1	6	10	37	51	67	36	197	257	30	51
Utah	1	1	4	6	15	15	2	4	39	37	4	15
Nev.	2	6	4	5	12	15	13	31	101	88	5	11
PACIFIC	86	96	295	245	531	480	390	488	3,772	3,930	283	352
Wash.	14	10	20	21	84	77	6	12	211	225	6	14
Oreg.	13	15	18	15	93	87	11	19	134	106	1	2
Calif.	58	71	246	196	341	302	372	455	3,229	3,383	268	329
Alaska	-	-	3	3	8	10	-	2	51	62	8	7
Hawaii	1	-	8	10	5	4	1	-	147	154	-	-
Guam	-	-	-	1	1	2	3	8	35	87	-	-
P.R.	-	-	-	1	4	23	108	237	63	162	41	36
V.I.	-	-	-	2	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	4	-	-
C.N.M.I.	-	-	-	1	-	-	1	9	-	31	-	-

N: Not notifiable U: Unavailable -: no reported cases

TABLE III. Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending October 19, 1996, and October 21, 1995 (42nd Week)

Reporting Area	*H. influenzae*, invasive		Hepatitis (viral), by type				Measles (Rubeola)			
			A		B		Indigenous		Imported†	
	Cum. 1996*	Cum. 1995	Cum. 1996	Cum. 1995	Cum. 1996	Cum. 1995	1996	Cum. 1996	1996	Cum. 1996
UNITED STATES	830	913	22,387	24,143	7,784	7,982	4	404	2	46
NEW ENGLAND	24	36	319	251	159	185	-	11	-	4
Maine	-	3	16	26	2	7	-	-	-	-
N.H.	9	9	14	11	14	18	-	-	-	-
Vt.	1	2	7	5	10	5	-	1	-	1
Mass.	12	11	165	105	55	71	-	9	-	3
R.I.	2	5	17	28	9	8	-	-	-	-
Conn.	-	6	100	76	69	76	-	1	-	-
MID. ATLANTIC	150	133	1,519	1,476	1,200	1,134	-	23	-	5
Upstate N.Y.	44	36	363	373	280	309	-	-	-	-
N.Y. City	31	32	485	695	491	342	-	9	-	3
N.J.	48	18	278	223	205	308	-	3	-	-
Pa.	27	47	393	185	224	175	-	11	-	2
E.N. CENTRAL	137	155	1,856	2,686	803	909	-	5	-	7
Ohio	80	77	636	1,512	105	91	-	2	-	3
Ind.	12	19	256	152	128	185	-	-	-	-
Ill.	32	40	460	549	210	240	-	2	-	1
Mich.	7	17	356	305	305	330	-	-	-	3
Wis.	6	2	148	168	55	63	-	1	-	-
W.N. CENTRAL	40	69	2,014	1,596	364	524	-	20	-	2
Minn.	25	38	108	163	51	49	-	16	-	2
Iowa	5	3	305	70	62	41	-	-	-	-
Mo.	7	21	954	1,123	179	359	-	3	-	-
N. Dak.	-	-	110	22	2	4	-	-	-	-
S. Dak.	1	1	41	54	5	2	-	-	-	-
Nebr.	1	3	190	41	36	28	-	-	-	-
Kans.	1	3	306	123	29	41	-	1	-	-
S. ATLANTIC	158	177	1,159	942	1,215	1,031	-	5	-	9
Del.	2	-	15	9	7	7	-	1	-	-
Md.	51	58	200	179	246	209	-	-	-	2
D.C.	6	-	35	22	29	19	-	1	-	-
Va.	9	26	140	173	117	93	-	-	-	3
W. Va.	7	7	13	21	21	45	-	-	-	-
N.C.	22	25	139	89	277	224	-	3	-	1
S.C.	4	2	44	40	74	43	-	-	-	-
Ga.	37	54	150	52	32	62	-	-	-	2
Fla.	20	5	423	357	412	329	-	-	-	1
E.S. CENTRAL	25	10	1,048	1,678	668	692	-	2	-	-
Ky.	4	4	38	41	52	60	-	-	-	-
Tenn.	12	-	687	1,400	381	547	-	2	-	-
Ala.	8	5	148	72	57	85	-	-	-	-
Miss.	1	1	175	165	178	U	-	-	-	-
W.S. CENTRAL	34	57	4,760	3,576	1,048	1,111	-	26	-	2
Ark.	-	6	417	469	65	53	-	-	-	-
La.	4	1	157	111	120	163	-	-	-	-
Okla.	27	21	1,980	928	59	139	-	-	-	-
Tex.	3	29	2,206	2,068	804	756	-	26	-	2
MOUNTAIN	86	99	3,581	3,363	914	686	-	152	-	5
Mont.	-	-	98	124	12	19	-	-	-	-
Idaho	1	3	191	273	76	80	-	1	-	-
Wyo.	35	6	29	97	36	24	-	1	-	-
Colo.	13	15	383	434	117	106	-	4	-	3
N. Mex.	10	12	316	696	318	258	-	16	-	-
Ariz.	11	25	1,425	915	210	97	-	8	-	-
Utah	8	10	813	596	81	53	-	117	-	2
Nev.	8	28	326	228	64	49	-	5	-	-
PACIFIC	176	177	6,131	8,575	1,413	1,710	4	160	2	12
Wash.	4	9	471	715	83	156	-	51	-	-
Oreg.	22	23	702	2,265	87	99	-	4	-	-
Calif.	146	140	4,861	5,410	1,217	1,431	-	36	-	5
Alaska	2	1	36	41	14	11	-	63	-	-
Hawaii	2	4	61	144	12	13	4	6	2	7
Guam	-	-	2	7	-	4	U	-	U	-
P.R.	1	3	99	84	310	503	-	7	-	-
V.I.	-	-	-	8	-	14	U	-	U	-
Amer. Samoa	-	-	-	6	-	-	U	-	U	-
C.N.M.I.	10	11	1	24	5	22	U	-	U	-

N: Not notifiable U: Unavailable -: no reported cases

*Of 197 cases among children aged <5 years, serotype was reported for 45 and of those, 14 were type b.

†For imported measles, cases include only those resulting from importation from other countries.

TABLE III. (Cont'd.) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending October 19, 1996, and October 21, 1995 (42nd Week)

Reporting Area	Measles (Rubeola), cont'd. Total		Mumps			Pertussis			Rubella		
	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995	1996	Cum. 1996	Cum. 1995
UNITED STATES	450	281	5	515	690	122	4,213	3,519	4	207	109
NEW ENGLAND	15	9	-	2	11	24	875	486	-	27	46
Maine	-	-	-	-	4	-	20	39	-	-	-
N.H.	-	-	-	-	1	-	90	43	-	-	1
Vt.	2	-	-	-	-	4	98	67	-	2	-
Mass.	12	2	-	2	2	20	610	307	-	21	7
R.I.	-	5	-	-	1	-	30	4	-	-	-
Conn.	1	2	-	-	3	-	27	26	-	4	38
MID. ATLANTIC	28	12	-	74	101	17	384	289	-	11	13
Upstate N.Y.	-	1	-	22	24	11	221	135	-	4	3
N.Y. City	12	5	-	16	15	-	29	44	-	4	8
N.J.	3	6	-	2	17	-	16	17	-	2	2
Pa.	13	-	-	34	45	6	118	93	-	1	-
E.N. CENTRAL	12	15	1	88	126	7	429	442	-	3	3
Ohio	5	2	-	39	42	1	193	122	-	-	-
Ind.	-	-	1	8	8	3	55	42	-	-	-
Ill.	3	2	-	19	35	3	141	89	-	1	-
Mich.	3	5	-	21	41	-	35	62	-	2	3
Wis.	1	6	-	1	-	-	5	127	-	-	-
W.N. CENTRAL	22	2	1	15	40	10	318	235	-	-	-
Minn.	18	-	-	5	4	8	251	120	-	-	-
Iowa	-	-	-	1	9	1	17	10	-	-	-
Mo.	3	1	1	6	22	-	33	55	-	-	-
N. Dak.	-	-	-	2	1	-	1	8	-	-	-
S. Dak.	-	-	-	-	-	-	4	11	-	-	-
Nebr.	-	-	-	-	4	1	8	10	-	-	-
Kans.	1	1	-	1	-	-	4	21	-	-	-
S. ATLANTIC	14	14	3	90	99	26	500	300	1	93	9
Del.	1	-	-	-	-	1	13	10	-	-	-
Md.	2	1	-	25	30	2	173	39	-	-	1
D.C.	1	-	-	1	-	-	2	6	-	2	-
Va.	3	-	-	12	21	-	71	19	-	2	-
W. Va.	-	-	-	-	-	-	2	-	-	-	-
N.C.	4	-	1	20	16	21	100	110	1	78	1
S.C.	-	-	1	6	10	1	37	23	-	1	-
Ga.	2	2	-	3	6	-	17	19	-	-	-
Fla.	1	11	1	23	16	1	85	74	-	10	7
E.S. CENTRAL	2	-	-	21	11	-	85	265	-	2	1
Ky.	-	-	-	-	-	-	39	22	-	-	-
Tenn.	2	-	-	3	4	-	19	206	-	-	1
Ala.	-	-	-	3	4	-	18	35	-	2	-
Miss.	-	-	-	15	3	-	9	2	N	N	N
W.S. CENTRAL	28	31	-	28	47	5	101	260	-	3	7
Ark.	-	2	-	2	7	2	12	34	-	-	-
La.	-	18	-	13	12	1	9	18	-	1	-
Okla.	-	-	-	-	-	2	10	31	-	-	-
Tex.	28	11	-	13	28	-	70	177	-	2	7
MOUNTAIN	157	68	-	21	30	4	353	524	-	7	4
Mont.	-	-	-	-	1	-	28	3	-	-	-
Idaho	1	-	-	-	3	-	102	99	-	3	-
Wyo.	1	-	-	-	-	-	5	1	-	-	-
Colo.	7	26	-	3	2	-	91	85	-	2	-
N. Mex.	16	31	N	N	N	4	54	99	-	-	-
Ariz.	8	10	-	1	2	-	27	153	-	1	3
Utah	119	-	-	2	11	-	19	27	-	-	1
Nev.	5	1	-	15	11	-	27	57	-	1	-
PACIFIC	172	130	-	176	225	29	1,168	718	3	61	26
Wash.	51	19	-	19	12	28	531	250	-	2	1
Oreg.	4	1	-	-	-	-	33	44	-	1	-
Calif.	41	108	-	128	192	1	573	375	3	55	20
Alaska	63	-	-	2	12	-	4	1	-	-	-
Hawaii	13	2	-	27	9	-	27	48	-	3	5
Guam	-	-	U	5	4	U	1	2	U	-	1
P.R.	7	3	-	1	2	-	1	1	-	-	-
V.I.	-	-	U	-	3	U	-	-	U	-	-
Amer. Samoa	-	-	U	-	-	U	-	-	U	-	-
C.N.M.I.	-	-	U	-	1	U	-	-	U	-	-

N: Not notifiable U: Unavailable -: no reported cases

TABLE IV. Deaths in 121 U.S. cities,* week ending October 19, 1996 (42nd Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	568	406	105	37	8	12	34
Boston, Mass.	119	75	28	13	1	2	4
Bridgeport, Conn.	45	34	7	2	-	2	4
Cambridge, Mass.	21	17	3	1	-	-	1
Fall River, Mass.	25	22	2	-	1	-	1
Hartford, Conn.	59	40	12	4	2	1	-
Lowell, Mass.	30	24	5	1	-	-	3
Lynn, Mass.	18	13	3	2	-	-	1
New Bedford, Mass.	32	27	3	2	-	-	2
New Haven, Conn.	46	26	10	3	3	4	1
Providence, R.I.	48	33	10	3	-	2	3
Somerville, Mass.	9	7	2	-	-	-	-
Springfield, Mass.	40	32	4	3	1	-	5
Waterbury, Conn.	19	13	5	1	-	-	2
Worcester, Mass.	57	43	11	2	-	1	7
MID. ATLANTIC	2,382	1,631	461	193	44	52	124
Albany, N.Y.	60	45	9	2	1	3	6
Allentown, Pa.	23	19	4	-	-	-	-
Buffalo, N.Y.	82	60	17	3	1	1	4
Camden, N.J.	38	23	8	3	3	1	3
Elizabeth, N.J.	22	14	4	4	-	-	-
Erie, Pa.§	54	41	8	3	1	1	6
Jersey City, N.J.	41	28	9	3	-	1	2
New York City, N.Y.	1,219	839	239	106	20	15	37
Newark, N.J.	67	27	17	16	2	4	10
Paterson, N.J.	31	16	8	4	2	1	1
Philadelphia, Pa.	300	210	47	25	9	9	18
Pittsburgh, Pa.§	84	53	18	5	2	6	3
Reading, Pa.	7	5	2	-	-	-	2
Rochester, N.Y.	128	94	24	5	-	5	17
Schenectady, N.Y.	24	15	8	1	-	-	1
Scranton, Pa.§	26	20	5	1	-	-	-
Syracuse, N.Y.	85	61	15	6	3	-	8
Trenton, N.J.	38	18	12	4	-	4	2
Utica, N.Y.	23	16	4	2	-	1	1
Yonkers, N.Y.	30	27	3	-	-	-	3
E.N. CENTRAL	2,002	1,375	353	171	49	54	110
Akron, Ohio	34	22	9	3	-	-	-
Canton, Ohio	37	22	10	3	2	-	2
Chicago, Ill.	352	209	65	50	18	10	27
Cincinnati, Ohio	97	68	20	7	1	1	6
Cleveland, Ohio	158	109	32	16	-	1	1
Columbus, Ohio	187	126	32	18	6	5	15
Dayton, Ohio	112	84	17	8	1	2	7
Detroit, Mich.	202	129	34	20	7	12	8
Evansville, Ind.	45	36	5	2	2	-	2
Fort Wayne, Ind.	61	46	8	3	2	2	1
Gary, Ind.	U	U	U	U	U	U	U
Grand Rapids, Mich.	59	44	7	3	1	4	-
Indianapolis, Ind.	183	127	35	12	3	6	12
Madison, Wis.	61	45	9	4	-	3	5
Milwaukee, Wis.	100	68	23	5	2	2	5
Peoria, Ill.	44	33	9	1	1	-	4
Rockford, Ill.	56	48	6	1	1	-	6
South Bend, Ind.	47	31	10	3	1	2	2
Toledo, Ohio	103	72	17	10	1	3	6
Youngstown, Ohio	64	56	5	2	-	1	1
W.N. CENTRAL	880	606	147	57	29	25	57
Des Moines, Iowa	110	80	24	4	1	1	11
Duluth, Minn.	26	18	7	1	-	-	2
Kansas City, Kans.	33	20	8	3	1	1	1
Kansas City, Mo.	124	76	18	10	1	3	8
Lincoln, Nebr.	34	26	6	1	1	-	2
Minneapolis, Minn.	223	160	32	17	10	4	17
Omaha, Nebr.	83	57	16	3	4	3	6
St. Louis, Mo.	117	82	18	7	4	6	2
St. Paul, Minn.	42	29	5	4	-	4	6
Wichita, Kans.	88	58	13	7	7	3	2
S. ATLANTIC	1,020	648	209	112	25	24	51
Atlanta, Ga.	80	40	25	10	5	-	3
Baltimore, Md.	243	150	42	39	5	5	13
Charlotte, N.C.	U	U	U	U	U	U	U
Jacksonville, Fla.	111	77	21	10	-	3	1
Miami, Fla.	109	63	29	12	3	2	1
Norfolk, Va.	39	26	8	3	1	1	3
Richmond, Va.	68	41	18	5	-	4	5
Savannah, Ga.	36	23	9	2	-	2	3
St. Petersburg, Fla.	49	36	6	4	-	3	4
Tampa, Fla.	148	108	25	15	-	-	16
Washington, D.C.	114	64	23	12	11	4	2
Wilmington, Del.	23	20	3	-	-	-	-
E.S. CENTRAL	676	446	137	53	15	24	38
Birmingham, Ala.	109	78	22	7	-	1	7
Chattanooga, Tenn.	75	48	17	5	-	5	2
Knoxville, Tenn.	74	50	15	6	3	-	6
Lexington, Ky.	59	42	13	3	1	-	5
Memphis, Tenn.	146	88	32	12	4	10	9
Mobile, Ala.	60	43	9	6	1	1	1
Montgomery, Ala.	24	16	5	1	-	2	1
Nashville, Tenn.	129	81	24	13	6	5	7
W.S. CENTRAL	1,355	871	264	121	59	39	78
Austin, Tex.	53	29	11	6	1	6	3
Baton Rouge, La.	40	26	8	4	1	1	2
Corpus Christi, Tex.	56	38	10	3	2	3	-
Dallas, Tex.	167	92	34	24	13	4	4
El Paso, Tex.	84	61	14	3	3	3	6
Ft. Worth, Tex.	103	75	13	7	5	3	5
Houston, Tex.	370	239	82	31	9	9	36
Little Rock, Ark.	58	37	12	4	3	2	8
New Orleans, La.	89	53	18	11	4	3	-
San Antonio, Tex.	202	133	38	20	6	4	10
Shreveport, La.	54	26	13	6	8	1	2
Tulsa, Okla.	79	62	11	2	4	-	2
MOUNTAIN	819	545	151	83	21	17	60
Albuquerque, N.M.	102	67	21	7	5	2	2
Colo. Springs, Colo.	53	38	12	2	-	1	2
Denver, Colo.	113	72	21	16	-	4	12
Las Vegas, Nev.	131	80	28	14	6	2	12
Ogden, Utah	18	15	1	2	-	-	2
Phoenix, Ariz.	129	74	26	21	2	5	6
Pueblo, Colo.	26	20	2	3	1	-	1
Salt Lake City, Utah	104	71	13	14	5	1	9
Tucson, Ariz.	143	108	27	4	2	2	14
PACIFIC	1,234	858	212	104	36	24	81
Berkeley, Calif.	15	12	3	-	-	-	1
Fresno, Calif.	U	U	U	U	U	U	U
Glendale, Calif.	19	12	2	4	1	-	2
Honolulu, Hawaii	82	61	14	4	2	1	7
Long Beach, Calif.	45	25	13	5	-	2	4
Los Angeles, Calif.	327	222	49	33	18	5	18
Pasadena, Calif.	25	16	5	1	-	3	3
Portland, Oreg.	99	69	19	8	2	1	4
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	134	99	21	11	2	1	14
San Francisco, Calif.	110	71	22	14	2	1	11
San Jose, Calif.	90	68	16	4	2	-	5
Santa Cruz, Calif.	15	14	1	-	-	-	2
Seattle, Wash.	157	100	33	14	3	7	2
Spokane, Wash.	45	36	6	2	1	-	4
Tacoma, Wash.	71	53	8	4	3	3	4
TOTAL	10,936¶	7,386	2,039	931	286	271	633

U: Unavailable -: no reported cases

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

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